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MOTOR BOATING

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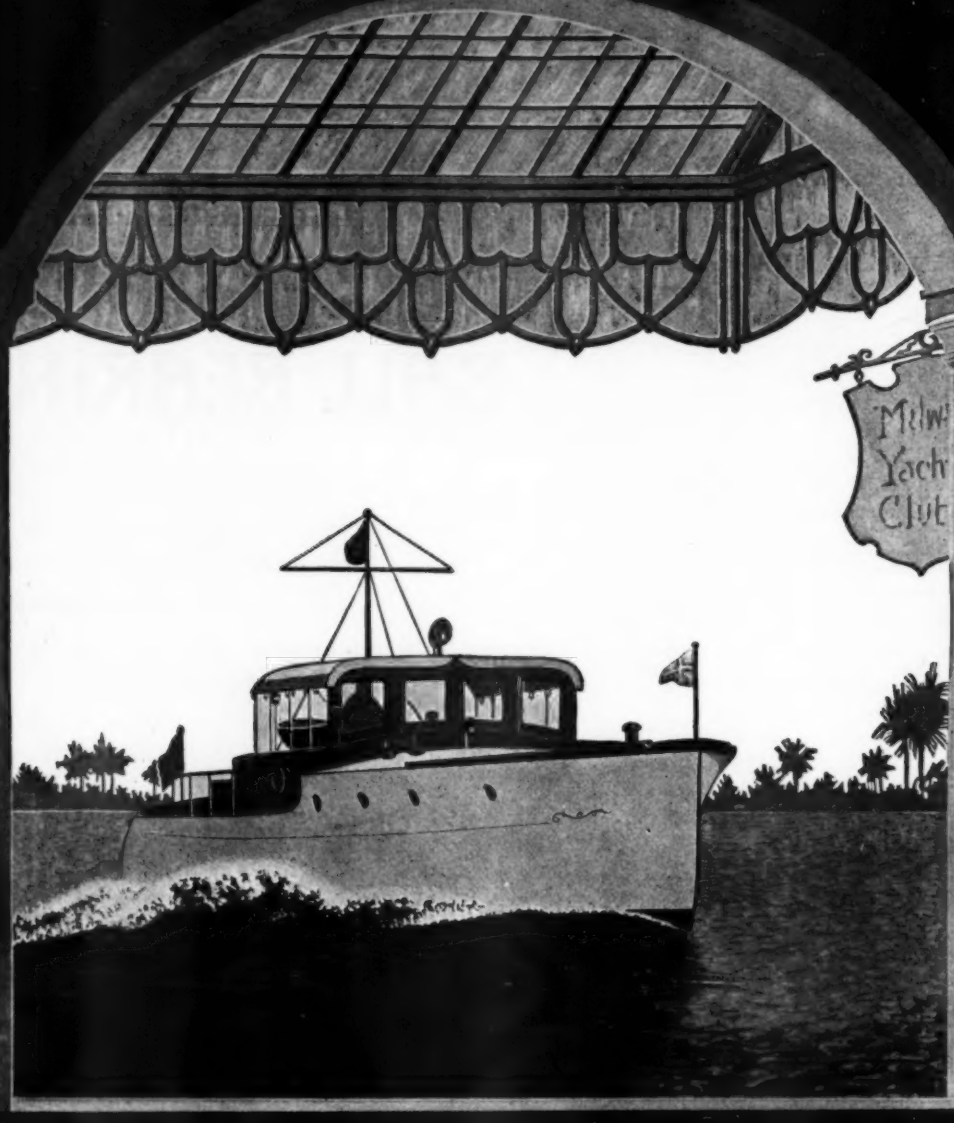

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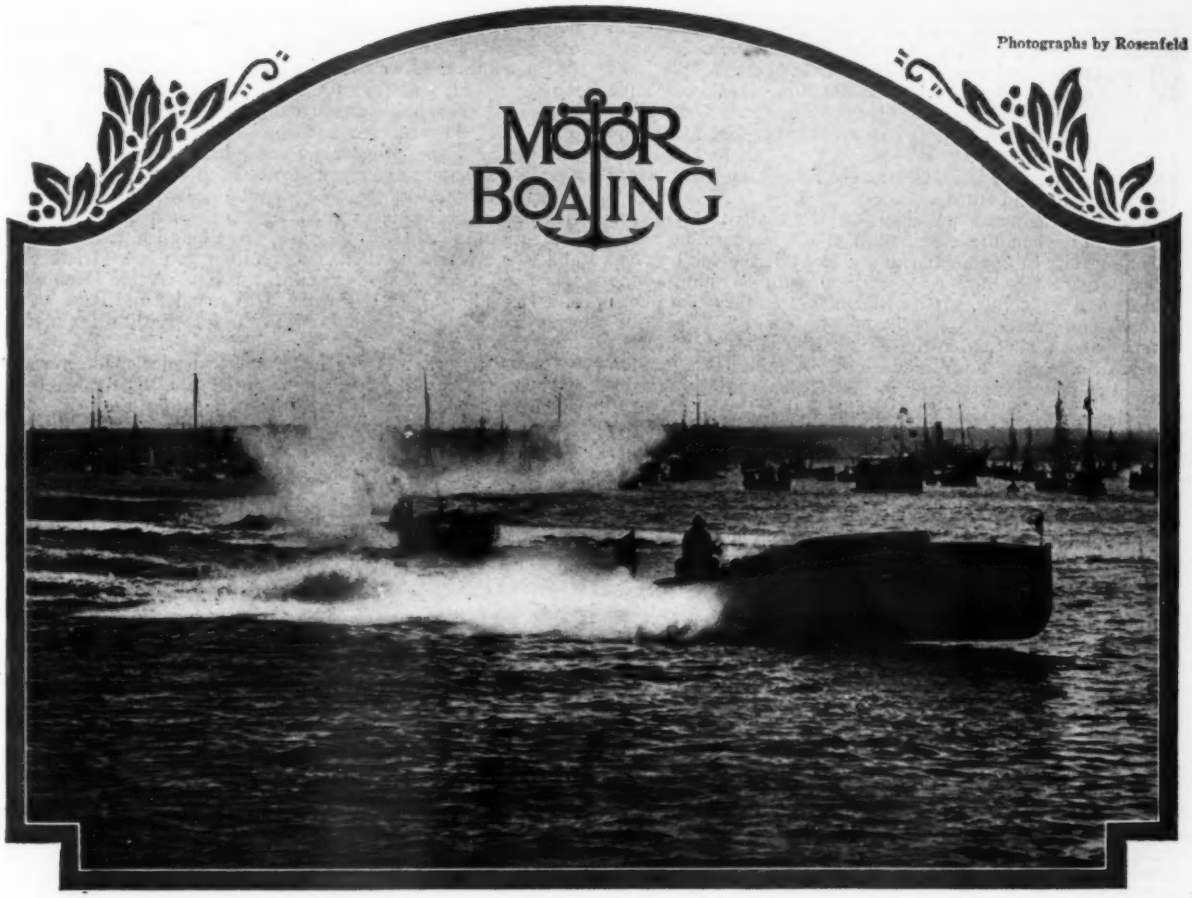
MOTOR BOATING

Photographs by Rosenfeld



Will America Bring the Trophy Back?

The British Accept Our Challenge for a Race Next Summer in England for the British International Trophy

PREPARATIONS are again under way for another race for the British International Trophy donated by Alfred Harmsworth, Lord Northcliff. This race, the eleventh to be held for this famous trophy, will be run in English waters beginning August 10 next.

Commodore Judson of the American Power-Boat Association, owner of Whip-po'will, Jr., the fastest boat in the world, and Gar Wood of the Detroit Yacht Club, owner of the family of Misses Detroits and winner of the Gold Cup Races at Detroit last August have challenged Great Britain for a chance to bring the trophy back to America, and advice has been received that the challenge has been accepted. It seems very probable, therefore, that this famous cup will find a resting place in America before many months have passed.

The experience derived from many Gold Cup competitions which represent the height of American hydroplane speed contests has been valuable to the American challengers and the lessons learned will stand them in good stead in their efforts to lift the cup. It seems quite probable that while this is going on that genial sportsman, Sir Thomas Lipton will be making strenuous efforts to lift another and perhaps more famous cup back to England with his yacht Shamrock IV.

The competition for the Harmsworth Cup is open to motor boats of all nations, but has never been won by any except English and American boats although in the second race a French boat won on a technicality.

At Southampton, Eng., August 2, 1907, was held the fourth race for the trophy and the first race in which an American boat competed. Here Dixie succeeded in winning the trophy which Commodore Schroeder proudly brought over to America. Dixie I racing against Daimler II beat the faster of the foreign boats by nearly two minutes over a 35-mile course, at the remarkable speed for that time of 24.9 knots. Dixie was 40 feet long and powered with a single engine of 130 h.p.

On August 3, 1908, in the fifth race for the cup Dixie II successor to No. 1 and also owned by Commodore Schroeder was successful in defending the trophy at Huntington Bay, L. I. The British challenging team of two boats consisted of Wolseley-Siddely and Daimler II. This newer Dixie had one 200-h.p. engine and covered 30 miles at an average speed of 27.75 knots beating her rival Wolseley-Siddely by only 49 seconds.

The sixth race was held on August 20, 1910. Dixie III, owned by Frederick K. Burnham, and powered with Dixie II's engine was again successful in defending the trophy, against the challengers Pioneer and Zigorella. Her time for the 30-mile course was 59 minutes 46 seconds or 30.13 knots. Pioneer was really the faster boat, but even these early examples of hydroplane construction were subject to trouble and Dixie, being more reliable, won.

The race in 1911 was a little different from previous events. The conditions had been changed making two wins necessary instead of one to lift the trophy. Dixie IV lived up to the reputation established by her predecessors and traveled the 30 miles the first day in 51 minutes 15 seconds and in 52 minutes 47 seconds the second day or at the rate of 35.12 knots for the fastest race. The English challengers

were Pioneer, Maple Leaf III, and Tyreless. The team mates of Dixie IV were Disturber II and Viva.

In 1912 England sent over three new boats, Maple Leaf IV, Mona, and Milmar to try for the cup. Of these Maple Leaf IV was by far the larger and faster. The others were only 26-27 feet long as compared to 40 feet for Maple Leaf IV. Her owner W. Mackay Edgar had the old engines of Maple Leaf III entirely rebuilt and they were very powerful and sturdy.

America had many possible defenders when the season opened but when the elimination trials were called there was a scarcity of good material and Baby Reliance II owned by J. Stuart Blackton was credited with a mile in one minute and 8 seconds. Baby Reliance II and IV were both entered and great things expected of them. Thirteen different boats took part in the elimination trials at different times. Some fast and some slow. At the close of the trials the committee picked for the American team Baby Reliance II, Baby Reliance IV, and Ankle Deep.

The first race at Huntington on Saturday, August 31, was witnessed by large numbers of spectators on yachts and boats anchored about the course. Maple Leaf had clutch trouble and started late. Baby Reliance II completed four laps of the course in 48 minutes, 39 seconds, doing 37.11 knots or 42.68 statute m.p.h. and won the race. Ankle Deep and Baby Reliance III had trouble and finished slowly. Maple Leaf and Mona ran consistently and averaged 42.5 and 36.6 statute miles respectively.

Labor Day and the second race brought forth a northeaster and a postponement until Tuesday when the weather conditions were slightly more favorable. At the starting gun at 2 P. M. all the boats got away promptly. Ankle Deep in the lead followed closely by Baby Reliance III and Maple Leaf. Baby Reliance II was three minutes, and Mona was over eight minutes late in getting started. After a strenuous race they finished as follows:

Maple Leaf	1 hour	6 minutes	25 seconds
Mona	1 hour	1 minute	47 seconds
Ankle Deep	1 hour	11 minutes	10 seconds
Baby Reliance III	1 hour	11 minutes	48 seconds
Baby Reliance II	1 hour	11 minutes	13 seconds

Maple Leaf being the winner on elapsed time from starting signal.

For the third race the interest was at a high pitch. Baby Reliance II, the American defender and Maple Leaf, the British challenger, each had one race to their credit and this race on Wednesday was to be the deciding one. All boats got away to a fine start except Baby Reliance III who was late. Mona was soon caught and passed and the American boats were doing excellently with every prospect of winning when Baby Reliance II slowed down and stopped. Ankle Deep still had a big lead over Maple Leaf and when nearly three-quarters of a mile ahead on the last lap a shaft broke, leaving her helpless permitting Maple Leaf to come home first winning the race, the series and the cup.

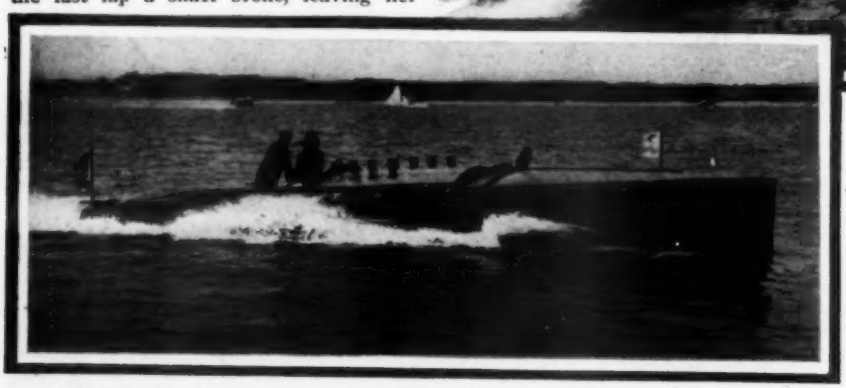
The tenth race was held in Osborn Bay, Eng., on September 10, 11, and 12, 1913. Never before had there been assembled such a collection of high-speed motor boats at one time. New records and speeds were made as high as 58.5 m.p.h. Some progress in ten years. However, it later developed that the course had not been correctly surveyed or layed out and its true length was in doubt therefore the speeds made have never been accepted as authentic. Seven boats in all took part in the race, three English, two French, and two American, all had more than 300 h.p. Disturber III, 600 h.p. and Maple Leaf IV, 750 h.p. Ankle Deep was America's hope with Disturber III, Crusader and Izme were team mates with Maple Leaf IV and Despujols I and II, the French entrants.

In the first race Maple Leaf and Crusader made a very poor start, Crusader being 17 minutes late. Disturber had carbureter trouble and slowed down finishing late.

Maple Leaf tried hard to overcome the lead of the others and did succeed in passing all of them except Despujols II.

Photographs by Levick

One of the Daimlers which represented Great Britain in 1907 and 1908

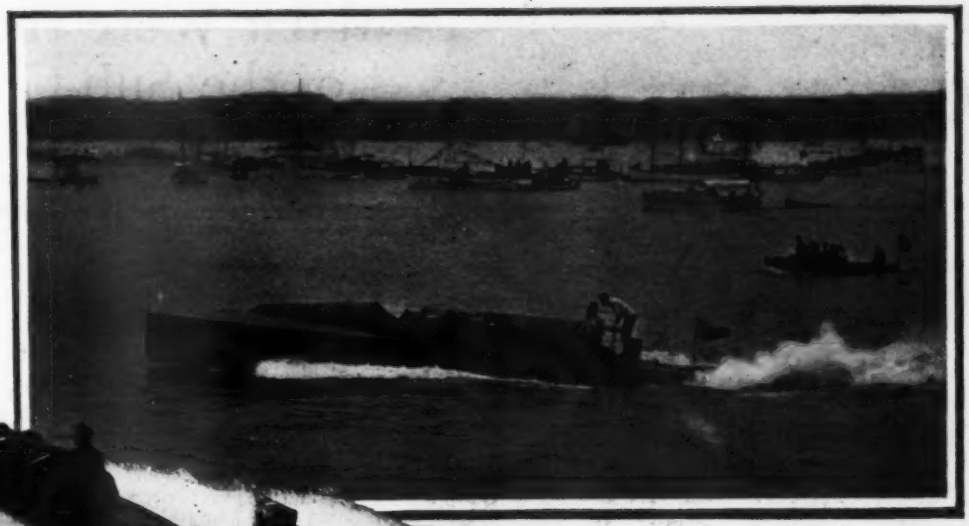


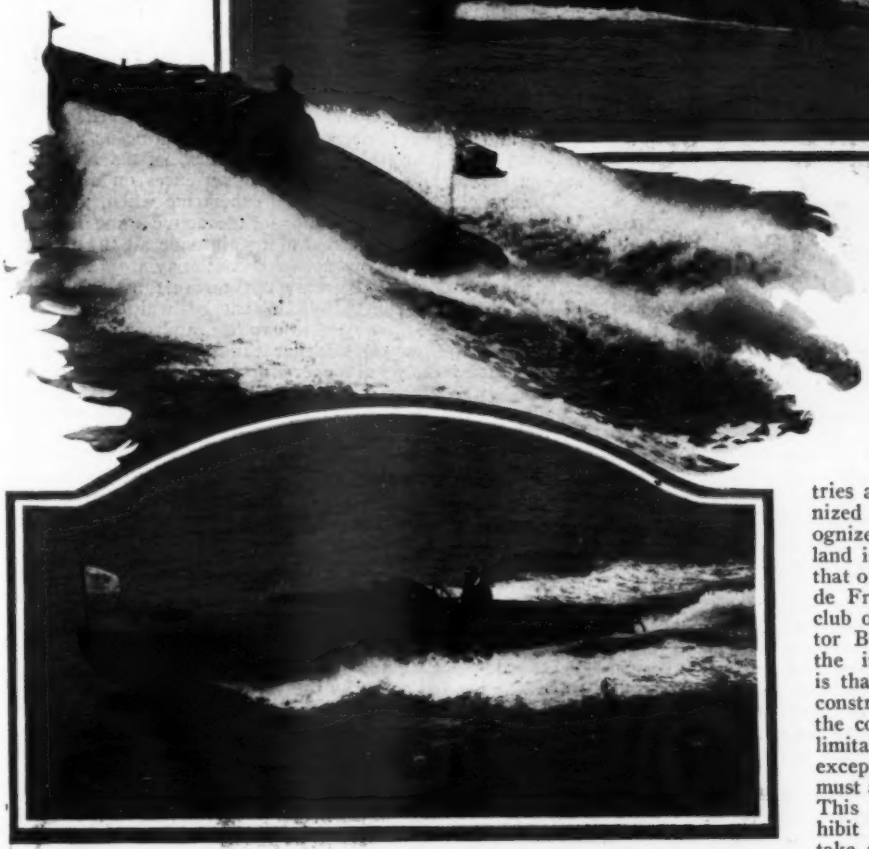
Dixie IV, the last of the Dixies, none of which were ever beaten

One of the first Dixies, before the days of hydroplanes

The Frenchman had too big a lead, however, and finished first, 41 minutes 43 seconds after starting and but slightly ahead of Maple Leaf. Her average speed for the 32.4 nautical miles was figured as 46.7 knots. Maple Leaf did even better, 46.8 knots, her delay at the start having cost her the race. Ankle Deep ran a fine race and was beaten by the greater power of Maple Leaf.

At the right: Maple Leaf IV, winner of the last two races, in 1912 and 1913. Below: Wolseley-Siddely, the English challenger in 1908, which was beaten by Dixie II by 49 seconds





Mona, a Thornycroft hydroplane, which was sent over by England in 1912

The next day the second race was equally interesting. All of the boats started more nearly together and Maple Leaf very quickly passed all the contenders except Despujols I and Despujols II. The boats retained their relative positions until the fourth round when Despujols I was passed. The leader Despujols II in an endeavor to make Maple Leaf extend herself, opened up and came to grief herself.

Seeing that his team mate was out Despujols I opened up wide and actually started to overtake Maple Leaf again. The effort was too much, however, as one of the exhaust pipes broke off and injured a mechanic. The boat continued at good speed notwithstanding but gave up the effort to win and finished second to Maple Leaf whose time was 39 minutes 25 2/5 seconds.

A poor start spoiled the third day's racing. The recall signal was heard only by Ankle Deep and Izme. Despujols II and Disturber III continued on around the course and were not timed until their second time around. Disturber and Izme had trouble and gave up. Maple Leaf finished first with Ankle Deep second thus winning the race and keeping the cup in England.

The conditions and rules for competition for the British International Trophy as amended in 1911 provide that the trustees of the trophy shall be the Royal Motor Yacht Club of Great Britain. The trophy may be competed for yearly by teams of not over three boats from each of the challenging countries. The boats to compose the teams from the various countries are to be selected by the recognized club of that country. The recognized club of Great Britain and Ireland is the Royal Motor Yacht Club, that of France is the Automobile Club de France and the recognized yacht club of the United States is the Motor Boat Club of America. One of the important points in the rules is that each competing boat shall be constructed wholly in every respect in the country which it represents. No limitation is placed on the power used except that the propelling mechanism must act only in or against the water. This provision will therefore prohibit the use of wings or planes to take advantage of air pressure.

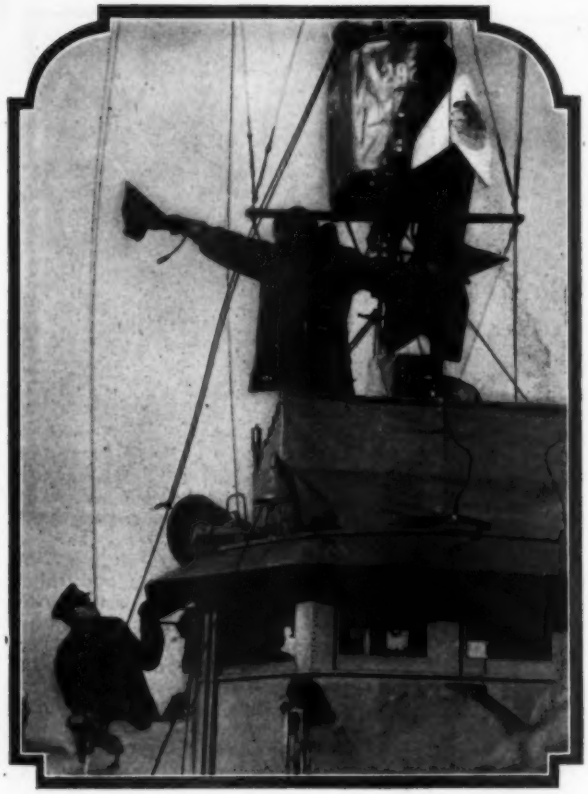
The Royal Motor Yacht Club of Great Britain is charged with the responsibility of making all of the necessary arrangements for the holding of the races and must bear the cost involved. Each boat must carry not less than two persons and all members of the crew must be natives or naturalized subjects of the country which the boat represents. The helmsman must be a member of the competing club.

The races are to be run under the racing rules of the Association Internationale de Yachting Automobile, the race committee being composed of one representative of the Royal Motor Yacht Club, one representative of the donor of the trophy and one representative of each of the recognized clubs of the countries which competed in the last previous race for the trophy.

The Deed of Gift stipulates that the races must be run between June first and October first of each year. Each race is to consist of two heats and as many more as may be necessary until one country has won two heats. The country which first wins two heats wins the trophy whether the heats be won by the same boat or different boats representing the same country.

Any motor yacht club, motor boat club, yacht or auto-

(*Continued on page 76*)



Wig-wag was the principal means of communication between the chasers when crossing the ocean

What Were the Faults of the Sub-Chasers?

Navy 110-Footers which Lacked Nothing as U-Boat Fighters Fell Short of Perfection in Other Respects. How the Motor Boat Builder May Profit by Their Example

By Alfred F. Loomis

SEVERAL times in the last few months I have delivered myself of the opinion that the 110-foot motor boat known officially to the Navy as the submarine chaser is the most seaworthy hull that was ever designed. Once or twice I have been caught up with the criticism that this was rather a sweeping statement to make. And, considering my lack of personal experience with other types of hulls—with Roman galleys, Malayan proas, and ocean greyhounds, for example—I have been obliged to confine my statement to motor boats. If there should be anyone so captious as to call my attention to the self-righting motor boat of the lifesaver's model I shall have to fall back on the explanation that it was less my intention to state a scientific fact than to express my admiration for the S. C.'s.

For the chasers are wonderful sea boats. They were selected for service in three of the roughest waters of Europe—the Adriatic, the Bay of Biscay, and the North Sea—and not one of the hundred-odd American-manned submarine chasers performing this arduous duty ever came off second best in a battle with the elements. This record, taken in conjunction with the fact that they crossed the Atlantic before commencing their work and then recrossed it long after that work was finished, substantiates my opinion that they are essentially seaworthy.

After making this simple eulogium it is possible, however—and usual—for anyone who has been in the chaser service to draw a long breath and say that they are the cussedest, uncomfortablest, most exasperating type of craft that ever, in the poet's phrase, felt the breath of life beneath their keels. I was talking the other day with an American naval aviation officer who had the unique experience of commanding a British dirigible only slightly smaller than the R-34, and who bore out the truth of my remarks. He told me that in the course of his training he had been required to familiarize himself with various types of water craft so that when co-operating with them from the air he could understand their problems and limitations. This training took him to sea on destroyers, submarines, and subchasers, and he had different experiences on each.

The most harrowing was in a submarine when, proceeding submerged, a sunken buoy or defective mine bumped against her bow, and rattled along the side all the way to her stern. Previous combats with bosche aviators and subsequent attention from enemy anti-aircraft batteries furnished no mental anguish like that of waiting for this bumping, clangorous object to explode, and my friend told me that for the few seconds that it took to make the passage of the submarine's hull, every man in the crew, himself included, was frozen in an attitude of agonized suspense. Coming to the surface immediately to relieve the tension, the sub was bombed by a friendly balloon, and submerged precipitately to make its way to port. His next experience was on a Plymouth chaser, and out of a short but tumultuous two days at sea he was sick a long forty-eight hours. As a result of his association with practically all types of naval craft—air, surface and subsurface—my friend assured me that the subs were the worst branch of the service and that the chasers ran them a mighty close second. Personally, I am inclined to give worst place to the chasers on the ground that whereas submarines are not always being mined or bombed (which was evidently my friend's chief grievance against them) the chasers are incessantly tossed and rolled about by the waves.

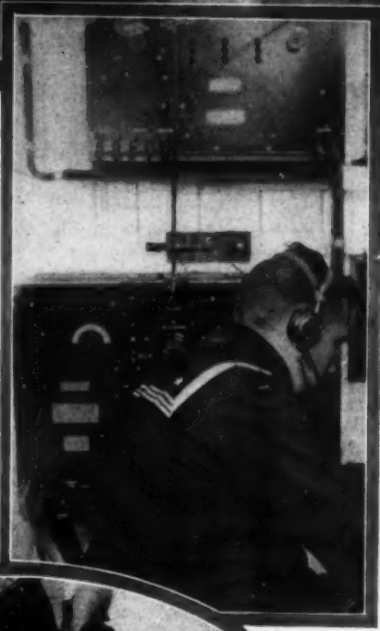
So my hearty admiration for the chasers is tempered by a realizing sense that they are uncomfortable. This was first demonstrated to us in the winter of 1917-18 when the

Target practice at frequent intervals kept the boys on their toes and ready for the real thing

temperature of the polar regions descended to New York and found the pioneers of the chaser force unprovided with heat of any sort except the doubtful emanations from oil stoves and electric radiators. Civilian workers at the Navy Yard took up our troubles in short order, however, and only five months after the chasers went into commission they were equipped with hot water heating systems of ample capacity to heat all compartments. That was in the latter part of March, and with the heating plants installed we were never again made uncomfortable by the cold, since we shoved off the next week for the warm regions of Bermuda and the Mediterranean.

But the warmth of the summer latitudes struck us like the blast from an open furnace door, and we found that the chasers were difficult of ventilation. This lack of ventilating facilities was, I believe, the principal fault of the submarine chasers, and I regret that in mentioning it I am unable to make my criticism constructive by pointing out a remedy. I speak of it, however, in the hope that designers of subsequent motor craft, whether for naval or private use, will consider ventilation next to godliness. Any sailor can accustom himself to the instability of his craft and will condone insufficient headroom or cramped quarters when he knows that these are necessary to the safety of his vessel, but there has yet to arise a race of men who can live without fresh air or sleep peacefully in the fumes of gasoline engines.

Life on one of these chasers was the hardest of any kind of service



A wireless operator was listening in at all times

In harbor the lack of air was not so marked, because it was possible to open the ports and fit in them the wind scoops provided for the purpose of arresting every vagrant breath of air that might be stirring. But it was the chaser custom to moor to a wharf in clusters of five or six (or a dozen if no one called a halt) whence it followed that none but the outboard boat received more than half the benefit of natural ventilation. The quarters aft were particularly insufferable because of the heat which billowed forth from the galley long after the fire had been extinguished following the evening meal, but nobody objected strenuously to harbor conditions, because all who were not gifted with the physique of a salamander took their mattresses topside and slept in the open air.

Under way, however, it was another matter. The port lights in the after quarters were a bare two feet above the waterline and in any kind of a sea were continuously immersed. Consequently, they were never opened, and in a following sea it was necessary also to dog down the ports in the deck house. Windsails for the after and the forecastle hatches might have been rigged, but the frequent use of the companionways made them undesirable. I had the misfortune to be quartered in this compartment of a chaser for several months and I'm tempted to swear that the air

Even at sea in the little speck of a boat, a thousand miles from the nearest land, there were joyous moments when off duty

it contained at the outset of a sea trip was imprisoned there until we returned to port.

In the forecastle, conditions were even worse, for not only the ports but the hatch was dogged in a seaway, and for the admission of air there was only a deck ventilator, by necessity turned away from the wind. Here twelve men slept, ate, and spent their off watches for days on end, and I can say also from experience that the atmosphere was unspeakable. Only words which are barred from the pages of a magazine may be used to describe the breadth and variety of the forecastle odor. For artificial ventilation there was an electric blower (which discharged, strangely enough, into the chart house); but this was rarely used because it put too great a strain on the storage batteries or on the generator, which, even without it, was worked to capacity.

The duties of the black gang compelled them to stay below decks for days at a time in a poorly ventilated motor room

Persons who live ashore may think that the matter of furnishing fresh air for the enlisted man is not worth haggling over, but in the nautical understanding the lack of it meant sleepy lookouts and a general lowering of the crew's morale. I have observed time and again that in smooth weather when the engine-room ports and skylight could be left open to permit a free circulation of air for the machinist's mates on duty, the engines ran for hours without giving annoyance; and that on rough days with everything battened down tight trouble followed trouble with disheartening regularity. With the engine-room atmosphere so blue from the smoke of oil poured on hot bearings that the black gang couldn't see the engine they were working on (as was frequently the case), it was humanly impossible to keep the power plant at the peak of its efficiency.

In this matter of ventilation I have reserved mention of the officers' quarters and radio room to the last, because underway conditions in them were the worst. On rough days we were given the alternative of death by suffocation or by drowning, according to whether we cared to leave the ports closed or open. Generally, we chose the moister variety, and if we survived the cruise, dried our books, bedding and personal belongings to the best of the sun's ability. But when in a particularly heavy seaway suffocation seemed preferable, we closed the ports and took gas. Of this there are three known kinds, any of which is capable of sending a man to the mat for the count. The first was the raw gas vapor which came directly from the tanks via the vents which exhausted conveniently near the cabin ports, and entered the quarters whether or not the lights were open. On the S. C. 131 we minimized anæsthesia from this source by capping the vents with lengths of rubber hose and leading them away from the ports. The second gas was similar to the first, but we could not properly identify or trace its origin. Its source was the bilges, although we could never find a leak in the fuel tanks beneath our quarters, and its strength was overpowering when, on entering or leaving port, we flushed the bilges with sea water. It was a smell different from and more sickening than raw gas and was certain to create headache and nausea in fifteen minutes.

The third gas was compounded of burnt gasoline, oil, and rubber, and we considered it our specialty. The engine-room bulkhead, laid down in the specifications as WT, or water-tight, was anything but gas-proof, and when its junction with the frames of the hull had rusted somewhat the fumes filtered through despite our best efforts to stop them. In an effort to clear the air we installed a goose-neck ventilator in the roof of the radio cabin and transferred the blower from the forecastle to the cabin. But when it was learned that a back draft from the blower forced the gases into the forecastle we abandoned that method of ventilation and endeavored to inure ourselves to the fumes as the lesser of the several evils.

Were I to build a motor cruiser for my personal use I should insist that the bulkheads be water- and gas-tight in more than name. The engine-room would be completely isolated from the other compartments. There would be fans and blowers in each and an adequate electric system to provide the ventilation which, when under way, is so necessary and which in the chasers was so impossible of attainment.

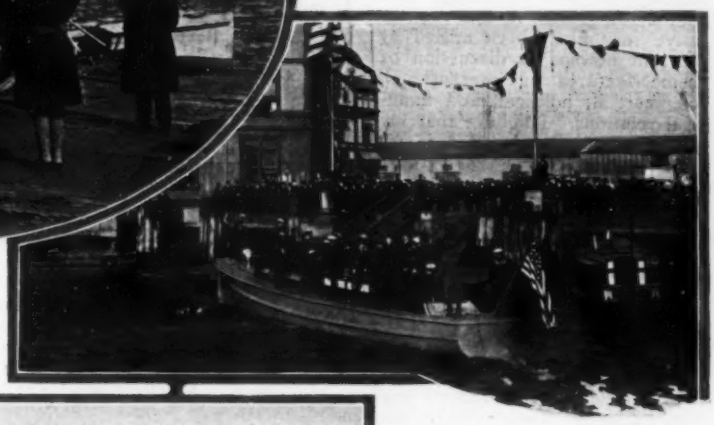
Only a little less annoying than the absence of air below decks was the presence of water which leaked in around the deck fittings and through the seams. It is a strange fact that, despite the haste with which the chasers were put together, a majority of them had dry hulls; and, in view of this, it is stranger still that there was hardly a deck in the fleet that was impervious to water. I recall a night last spring when we were entering the Strait of Gibraltar from the east, bucking a head wind that kicked up a short and violent chop and deluged our forecastle deck with spray and solid water. In order to keep in formation we were going slightly too fast for comfort in the sea then running, but I was more than a little surprised midway of the watch to see the deck force advance by rushes from the forecastle hatch to the pilot house and to hear them explain that the timbers were weaving every time the vessel pounded. This was interesting if true, and, ordering the helmsman to hold her head off the wind while we dodged down the hatch, I took the boatswain's mate with me and went to listen to the weaving timbers.

What I heard when we had passed the barrage of flying spray and were secure in the forecastle was an incessant dripping of water, and on looking around me I saw a deck shiny with moisture and transom cushions sodden with it. Each time we dipped our nose into a wave the water surged down the main deck, splashed against the hatch coaming and poured down the ventilator, and then as the wave receded a veritable cascade dribbled down the hawse pipe. This over-abundance of water impressed me with all the force of a novelty, for it was nearly a year since I had been in a chaser forecastle under way and I had forgotten the ubiquitous puddle of water in the middle of my bunk that used to greet me as I turned in at the close of a watch. But this life-sized imitation of the Cave of the Winds was typical of every submarine chaser, and no amount of calking or puttying could make the forecastle less aqueous. The weaving of the timbers, by the way, was imaginary—either that or the sea had subsided in the thirty seconds it took me to go from the chart house to the crew's quarters.

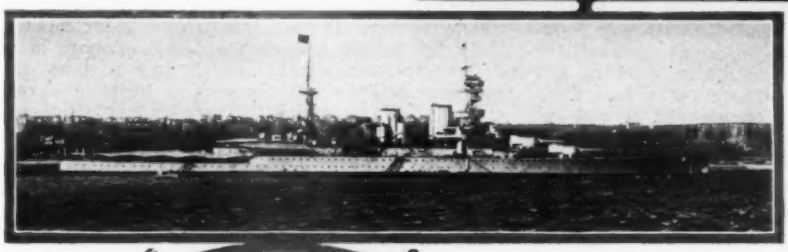
(*Continued on page* 64)

Prince of Wales Honors Columbia Yacht Club

The Prince of Wales stepping ashore for the first time in New York City. Quite properly, he chose the city's foremost yacht club—the Columbia —as his landing place

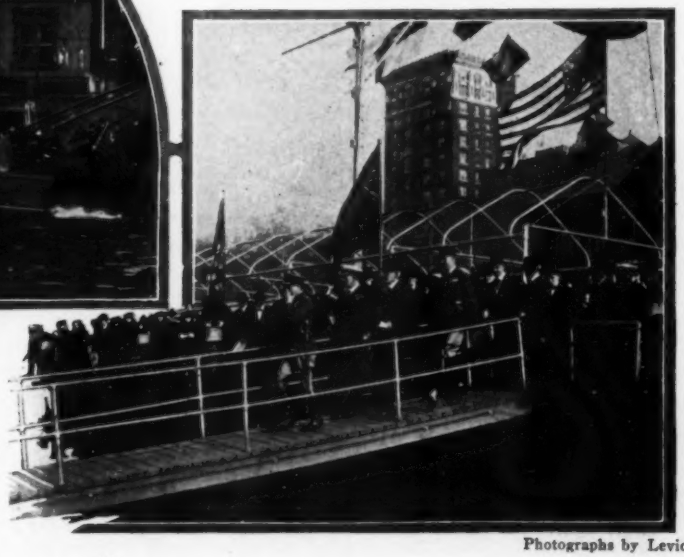


Renown, one of England's latest and most powerful battle cruisers, on which the Prince of Wales traveled the high seas and used by him as his home while in New York



Although all the tenders and barges of Renown were steam propelled yet American motor boats were used extensively by the Prince during his recent visit. The illustration above shows one of our Admiral barges driven by gasoline engines used by the Prince

The Prince leaving the Columbia Yacht Club to go aboard Renown anchored in the Hudson off the Club



A Great Lakes cruiser built by the Great Lakes Boat Building Corp. of Milwaukee, which was used by the Prince of Wales for some of his trips around New York City

Photographs by Levick.

Never Were Prospects Brighter for Exporting

The Many Influencing Factors Which Should Make 1920 a Banner Year for the Manufacture of Boats and Marine Engines—Various Markets Which Will Prove Fertile Fields

By B. Olney Hough

WE are especially fortunate in being able to present to our readers such a valuable and timely article on this important subject of exporting as the one written by Mr. Hough. We strongly urge every member of the industry to carefully read Mr. Hough's article, as it contains much valuable data and many important points.

MoToR BoatinG realizes that the details connected with exporting are somewhat complex and often-times confusing to one who has not had experience in those lines. To that end we have made arrangements to supply expert advice and information to any who ask for it. We are also able to actually handle the details of export shipments for our advertisers in instances where we can be of service—EDITOR.

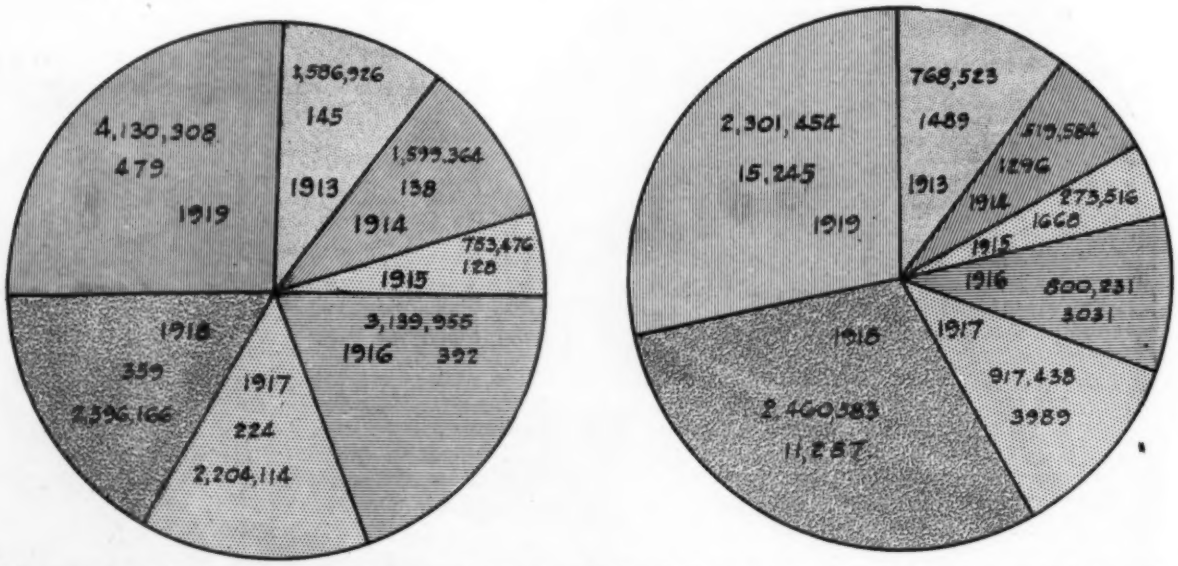
BRIGHTER prospects than ever before for growing export markets face American marine engine manufacturers and, in comparative degree, motor boat builders, as the year draws to a close. I say this advisedly, in full knowledge that not a few people in this country have very likely been misled by current newspaper discussion of some features of international, commercial, political, and financial relations. I believe that my belief is well founded. Here are some reasons.

Bright prospects confront us because with a natural development of commerce and civilization in the smaller countries of the world, motor boats of one description or another become more and more indispensable whether for pleasure yachts, and the increasing development of motor boating clubs is to be noted, or for "taxicab" use in harbors and at ports, at seaside resorts and bathing beaches, for business and for pleasure, and again for ferries along rivers and steamship tenders in harbors. Finally, there is to be remembered the tremendous increase in popularity of the internal combustion engine as an auxiliary for sailing vessels used both in the fishing industry and very especially for the many new cargo sailers of from 100 to 500 tons burden which everywhere all around the world have been and are being built in quantities to supplement the still existing scarcity of steam tonnage.

Bright prospects for exporting American marine engines are favored by the coal shortage existing in all parts of the world and the excessive prices demanded for coal. When ocean freight charges alone on a ton of coal amount to $25 and more, it seems clear that every effort will be made to replace coal by other fuel. Hydroelectric plants are being promoted and developed in very large numbers in Europe and in many countries of the world, which will help to some extent in an industrial way, yet electric power cannot reach everywhere and there is to be noted a great increase in the demand for internal combustion engines for industrial purposes. However, electric power does not and cannot reach to the sea. Oil-burning steam engines relieve the situation in increasing degree so far as large vessels are concerned. The small vessels must depend on the internal combustion engine, whether gasoline or kerosene or heavy oil, and no matter what type, whether Diesel, semi-Diesel or other.

Bright prospects face us in spite of the much discussed unfavorable rates of foreign exchanges. I believe firmly in the statement, for because of the real requirements of all countries of the world, American engines will have to be bought because they are needed, because they are indispensable to the continuance and the development of commerce and industry—they will have to be bought no matter what they cost. If the buyer in some other country has to pay from 50 per cent. to 100 per cent. more in his local currency than he would have to pay in times of normal exchange, still he will buy because he must have engines of this sort with which to carry on his business, develop it more efficiently and more economically, build up new business, perhaps even keep any business at all.

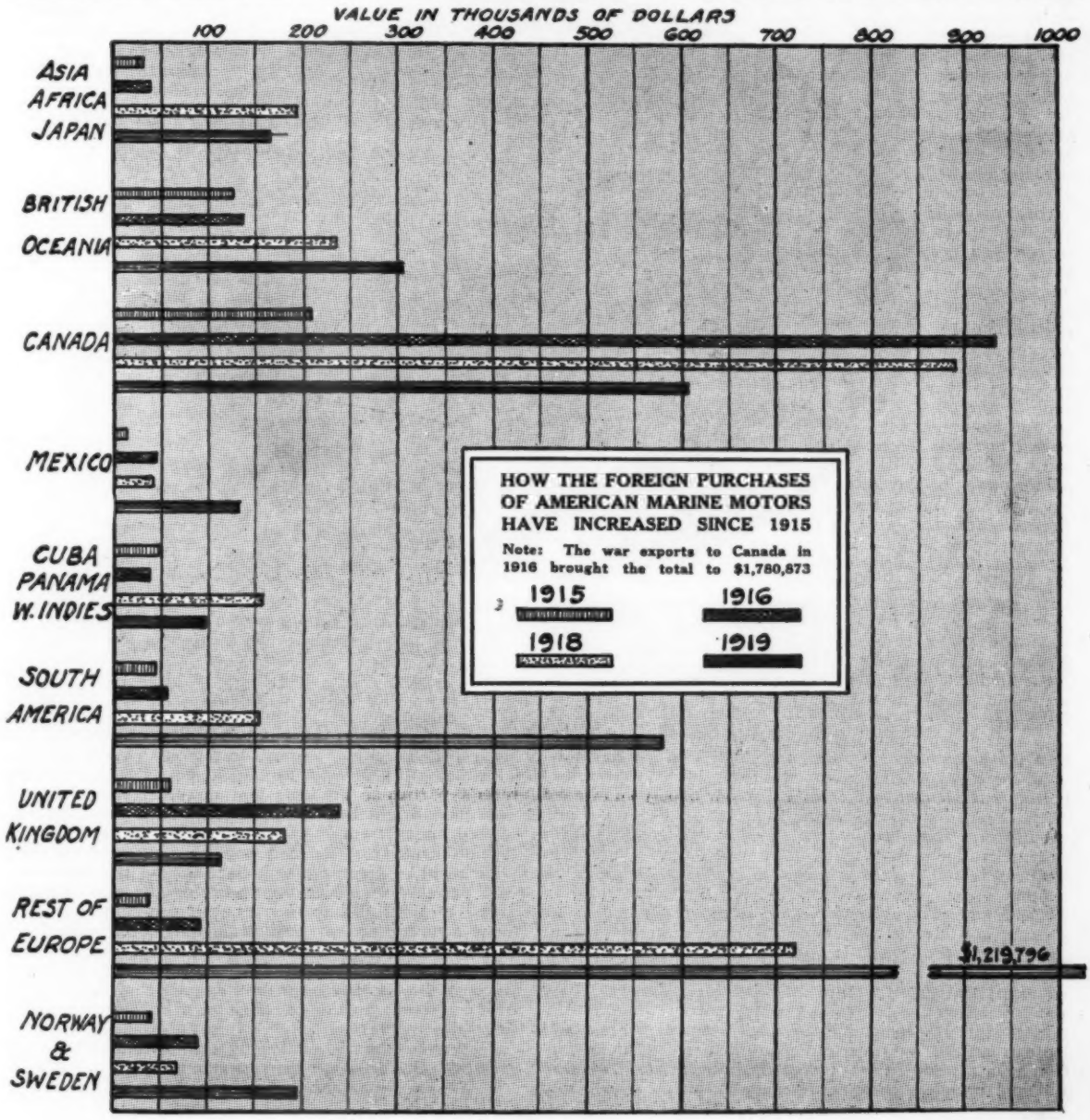
American marine engines I have reason to believe are cheaper and can well stand the impost of high exchange rates. I spent the first six months of this year in France, Italy, and Belgium. When I was in Paris one of the largest machinery houses in Europe showed me copies of letters which it had addressed to three French Ministers arguing against an increase in French import duties and demon-



The diagram on the left represents the exports of boats since 1913 and the one on the right indicates exports of boats. The larger figure is the value of the respective exports each year and the smaller one is the number of boats or engines exported each year. The areas of the segments are proportioned to the value of the respective exports

strated by figures of landed costs that American gasoline engines could be landed in France at one-third the cost of any French engine of similar character, and that in consequence any high tariff as a protection to French industry was an absurdity. I found the same thing again when I visted Bordeaux where an ex-naval officer of the French marine complained of the cost of the French marine engines which he was buying (because of a natural and comprehensible feeling of resentment over the rather shabby treatment he had received from two American manufacturers) and declared that he could buy American engines at one-third the price.

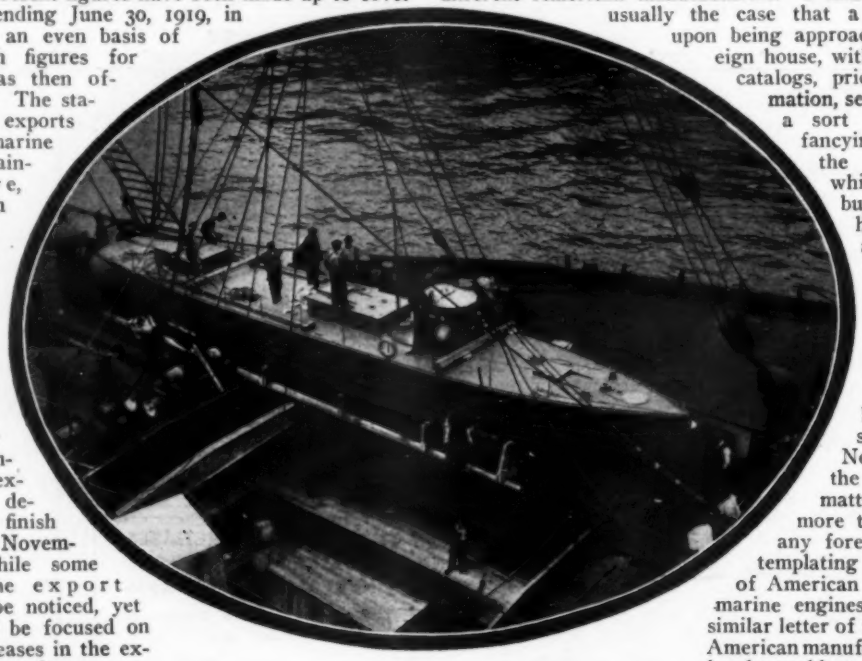
As a matter of fact, I think there is a good deal of exaggeration in the public prints nowadays when aspects of our commerce as a whole are discussed in the light of ruling rates of exchange. I believe it unquestionable that even those countries of Europe most unfavorably affected by present conditions in the exchange market will continue and must continue to buy tremendous quantities of American supplies, cost what they may. Manufacturers in Europe require raw materials and finished products for manufacturing purposes and they require new machinery to replace worn out machines as well as improved machines in order to continue their industries, that is to say, to keep on manufacturing and stay in business. Merchants require fresh supplies in order to go on doing business and much or all of these supplies will have to come from the United States. Undoubtedly high prices and enhanced cost of supplies, because of the high rates of exchange, will curtail business to a considerable extent. However, no one who has considered the subject seriously has ever believed that our stupendous war exports would continue forever. It may indeed be a result quite healthy for the future of our markets all over the world if our exports are somewhat restricted for the time being, but this does not mean that the sum total of American export trade will revert to pre-war figures. Far from it. We shall continue to do a tremendous export trade, vastly greater than anything we knew prior to 1914. This is certain no matter what exchange rates may be. Take as an illustration the figures published as this article is written of our exports to Latin America for September, $32,000,000 as compared with $24,000,000 for the same month a year ago. For the nine months ending with September, $337,000,000 as against $226,000,000 for the corresponding period of 1918. It will be remembered that the drop in exchange and the prevalence of low unfavorable rates of exchange date back six months. I quote these figures merely as a reminder



that in any event France and Italy are not our only foreign customers and that there are many conditions affecting commerce other than exchange rates.

At this point I cannot forbear remarking that American marine engine and motor boat people can do their share toward the rehabilitation of European countries and the restoration to approximately normal conditions of international commerce and exchange by realizing the fact that one of the best and most effective means to this end will be the increase in European imports into this country and very especially the development of big investments of American money in the securities of these countries, meaning thereby not only the national and municipal bonds which are being offered at highly favorable rates, but, even preferably, in comparatively new and hitherto almost unknown investments in industrial enterprises in these countries.

So far as concerns recent export trade in the particular industry which interests us, attention is drawn to the accompanying statistics which have been supplied through the special courtesy of the Bureau of Foreign and Domestic Commerce to accompany this article. Despite the fact that our government statistics have begun to be compiled as covering the calendar year, as has never been the practice heretofore, the present figures have been made up to cover the fiscal year ending June 30, 1919, in order to afford an even basis of comparison with figures for the year 1918 as then officially reported. The statistics of our exports for gasoline marine engines are certainly impressive, showing a growth not only in value, which, of course, is not a really adequate basis for comparison in view of considerable increases in price, but an increase of 20 per cent. in the number of motors exported and this despite the actual finish of the war in November, 1918. While some decreases in the export figures are to be noticed, yet attention should be focused on the notable increases in the export business covering an encouraging variety of markets, as for example France, Italy, Norway and Spain, Mexico and Newfoundland, Argentina, Chile and Peru, China, Japan and Siam, Australia and South Africa, and the Philippine Islands.



Getting ships to carry the exports of American motors and motor boats is the hardest problem today

Complaints continue to be received from buyers of American marine motors in foreign countries of carelessness, indifference or even ignorance shown by American exporters. It seems to me certain that our expert knowledge and skill are improving all the time and that more of our manufacturers are learning how to do things right. Yet a word of caution in this regard may be called for. Our export business is too big and important to be allowed to go without serious attention and study. Complaints refer to the old and rather hackneyed subject of proper export packing and also to the inexcusable omission to ship all parts complete. Then, too, there have been complaints that the cylinders of American motors quickly rust out because apparently they are intended for fresh water use and have been shipped to salt water ports. More unfortunate, still, are complaints of what seem to be fast and loose treatment by American manufacturers of their foreign agents, who, if they deserve appointment at all, deserve full and complete backing in every fashion. Undeniably we are not quite so careful and exact in some of our engineering practices in this country as are engineering firms in Europe. We ought so far and so fast as possible to remedy any such shortcomings in our own industry. A most unfavorable impression has been created in Europe by the reports of the serious difficulties experienced in the machinery rooms of some of our new and hastily constructed steamers. Thus, in August, 1919, there were casualties reported by Lloyd's in the case of no less than forty-three of our wooden vessels and in twenty-three of these instances the casualty was one of "machinery trouble". Criticism on this account may be misjudged because of the widely known fact of rushed construction, turning out vessels in time heretofore unprecedented. None the less, our rivals and competitors conveniently forget such excuses and it should be the ambition of every engine builder of no matter what size to put his products into the hands of his foreign customers in perfect condition.

Another criticism coupled with a bit of advice I have personally to offer. I have lately been paying a good deal of attention to the character of correspondence which American manufacturers are addressing to their foreign customers and have studied examples from several hundred different American manufacturers. I find it to be quite usually the case that a manufacturer, upon being approached by a foreign house, with a request for catalogs, prices, and information, seems to manifest a sort of egotism in fancying that his is the only concern which the foreign buyer in question has approached, and accordingly simply dictates a "Dear-Sir — Yours-truly" letter calling attention to catalog and price list sent under separate cover. Now, of course, the truth of the matter is that it is more than likely that any foreign buyer contemplating the purchase of American motor boats or marine engines has written a similar letter of inquiry to every American manufacturer whom he has been able to hear of or who he has reason to fancy may be able to produce something which may answer his requirements. Hence, it follows that the manufacturer's letter ought to be a good deal more than "Yours received. We hope to have your order." Full and specific information must be given to the inquirer who may be distant anywhere from 1,000 to 15,000 miles. Adequate reasons must be advanced why that prospective buyer should purchase the manufacturer's particular products and no other manufacturer's. The good, original or novel feature of the motor which is offered must be emphasized just so far as possible in the fashion in which a salesman would present such arguments if he could be present face to face talking the matter over with the prospective customer, urging the sale and never giving up until all hope is over. Of course, plenty of our manufacturers do get business from stereotyped "Dear-Sirs-Yours truly" correspondence, but I believe it is very seriously to be doubted if those manufacturers get all the business they ought to get or might if they were to give time and study to the composition of effective order-getting sales letters.

The tables on the following pages should be of the greatest value to American manufacturers.

(*Continued on page* 150)

The Newest Thing in Motor Houseboats

Bilma II, a New Fifty-Two Footer with a Four-Cylinder Standard Motor and Accommodations for a Large Party, Proves to Be a Popular Design

A corner of the saloon below decks

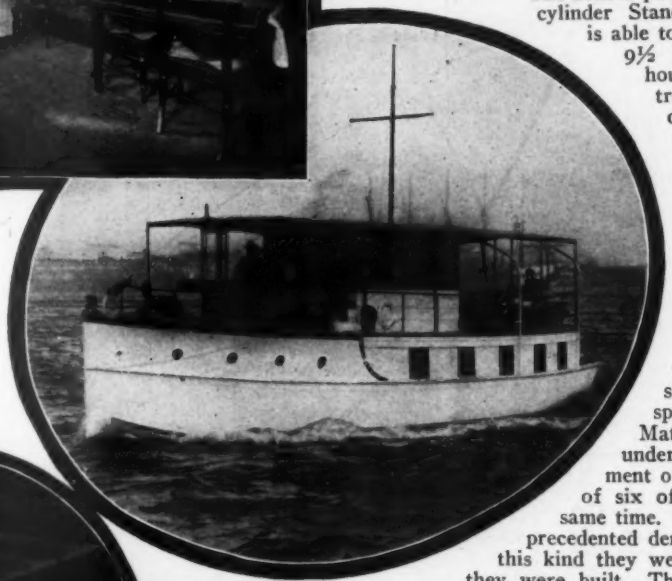
THE 52-foot houseboats turned out by the Mathis Yacht Building Co., of Camden, N. J., from all accounts are able to speak for themselves. Six of these boats are in Florida this winter owned by prominent yachtsmen who at the last minute were unable to get boats between 60 and 75 feet and found they could be comfortable on these 52-foot boats.

The unusual part of this boat is the deck house which can be used as a living or observation room. This house although having full headroom does not detract from the appearance of the boat and at the same time does not affect her as regards top hamper.

The windshield forward is the newest development for the protection of the captain and by the use of this windshield and the awnings on the sides we are able to make a complete enclosure in bad weather which at the same time can be used for sleeping on deck.

This boat has a large double state-room, one saloon below that can sleep two grown persons and two children, modern toilet room and shower bath, complete galley with shipmate range fitted up with kerosene burner also small kerosene stove fitted to the hot water heating system for the boat.

The boat is powered with a four-cylinder Standard engine and is able to make a speed of 9½ to 10 miles per hour and is controlled from the deck. A feature on this boat is the complete independent electric power plant with Edison storage batteries.



The 52-footer underway

The ever-increasing popularity of this type of boat among yachtsmen who desire comfort and spaciousness led the Mathis company to undertake the experiment of building a series of six of this type at the same time. Owing to the unprecedented demand for boats of this kind they were all sold before they were built. This successful outcome of the experiment will undoubtedly lead to its repetition at an early date.

The construction of these boats is of a very substantial and serviceable nature. They were built according to Mathis standards which is saying much. The main saloon is finished in mahogany up to the window sills with ivory white enamel above. The deck beams with a mahogany facing break up the expanse of white in the ceiling above.

The deck house is one of the features of the yacht

The furnishings throughout are elaborate and complete, as is shown in this picture of the spacious after deck

MoToR BoatinG's Annual Review of Racing

Winners of American Power-Boat Association Sanctioned Races for 1919

Name of Winning Boat	Owner and Club	Distance Miles	Club Holding Race	Class Local	Elapsed Time	No. of Cyls.	Bore & Stroke	RPM	HP	LWL	Area MS	Rtg.
Hoosier IV.....	H. R. Duckwall, Miami Beach Y. C.	10 stat.	Miami Beach Y. C.	Displacement Racers	0-21-03	6	5½x6¾	1,500	106.86	28.0	3.0	67.29
Whip.....	R. E. Maypole, Miami Beach Y. C.	10 stat.	Miami Beach Y. C.	Express Cruiser	0-21-37	12 Tw-sc.	5¾x7	1,300	242.22	41.0	6.0	61.92
Whip.....	R. E. Maypole	10 stat.	Miami Beach Y. C.	Express Cruiser	0-21-21 3/5	12 Tw-sc.	5¾x7	1,300	242.22	41.0	6.0	61.92
Hoosier IV.....	H. R. Duckwall, Miami Beach Y. C.	20 stat.	Miami Beach Y.C.	Displacement Racers	0-40-32 3/5	6	5½x6¾	1,500	106.86	28.0	3.0	67.29
Hoosier IV.....	H. R. Duckwall, Miami Beach Y. C.	10 stat.	Miami Beach Y. C.	Displacement Racers	0-18-07	6	5½x6¾	1,500	106.86	28.0	3.0	67.29
Hoosier IV.....	H. R. Duckwall, Miami Beach Y. C.	6 laps ½	Miami Beach Y. C.	Displacement Racers	34-55 stat. m.p.h.	6	5½x6¾	1,500	106.86	28.0	3.0	67.29
Victory II.....	H. A. Jackson, New York Ath. Club	100 naut.	New York Ath. Club	1 Cruiser	12-02-10	4	4¾x5½	575	15.84	35.77	9.12	35.00
Kodak	R. J. Haslinger, Hudson River Y. C.	100 naut.	New York Ath. Club	1 Cruiser	12-36-25	4	4¾x5½	660	21.44	32.33	11.20	35.38
Gardenia.....	H. Anderson New York Ath. Club	100 naut.	New York Ath. Club	1 Cruiser	11-50-00	4	6 x8	380	28.66	43.79	12.32	38.36
Uonda.....	A. B. Duryea, Huguenot Y. C.	100 naut.	New York Ath. Club	1 Cruiser	12-46-35	4	6½x7	400	22.94	40.00	10.55	37.36
Pickaninny.....	Bell & Taylor, Camden M. B. C.	102 naut.	Delaware Riv. Yacht Racing Association	1 Cruiser	11-41-47	.....	.....	.....	.....	.....	.....	34.20
Naomi.....	Wm. MacNamee, Riverside Y. C.	102 naut.	Delaware Riv. Yacht Racing Association	1 Cruiser	13-57-04	.....	.....	.....	.....	.....	.....	29.87
Miss Detroit III..	G. A. Wood, Detroit Yacht Club	33.06 stat.	Thousand Islands Yacht Club	Hydroplane First heat	0-39-38	12	Not	measu	red for	rating		
Miss Detroit III..	G. A. Wood, Detroit Yacht Club	33.06 stat.	Thousand Islands Yacht Club	Hydroplane Second heat	0-34-41	12	Not	measu	red for	rating		
Miss Detroit III..	G. A. Wood, Detroit Yacht Club	33.06 stat.	Thousand Islands Yacht Club	Hydroplane Third heat	0-37-00	12	Not	measu	red for	rating		
Miss Detroit III..	G. A. Wood, Detroit Yacht Club	99.18 stat.	Thousand Islands Yacht Club	Total Race	1-51-19	12	Not	measu	red for	rating		
Miss Detroit III..	G. A. Wood, Detroit Yacht Club	30 stat.	Detroit Yacht Club Gold Cup	Hydroplane First heat	0-41-48	12	Not	measu	red for	rating		
Miss Detroit III..	G. A. Wood, Detroit Yacht Club	30 stat.	Detroit Yacht Club Gold Cup	Hydroplane Second Heat	0-60-50	12	Not	measu	red for	rating		
Miss Detroit III..	G. A. Wood, Detroit Yacht Club	30 stat.	Detroit Yacht Club Gold Cup	Hydroplane Third heat	0-32-57	12	Not	measu	red for	rating		
Miss Detroit III..	G. A. Wood, Detroit Yacht Club	90 stat.	Detroit Yacht Club	Total race	2-14-50	12	Not	measu	red for	rating		
Heldena II.....	G. Clark, Toronto Motor Boat Club	30 stat.	Toronto Motor Boat Club	Can. Inter. Gold Challge. Trophy First heat	0-55-37		Not	measu	red for	rating		
Miss Toronto.....	J. Bickell, Toronto Motor Boat Club	30 stat.	Toronto Motor Boat Club	Can. Inter. Gold Challge. Trophy Second heat	0-56-32		Not	measu	red for	rating		
Heldena II.....	G. Clark, Toronto Motor Boat Club	30 stat.	Toronto Motor Boat Club	Can. Inter. Gold Challge. Trophy Third heat	0-57-18		Not	measu	red for	rating		
Heldena II.....	G. Clark, Toronto Motor Boat Club	90 stat.	Toronto Motor Boat Club	Can. Inter. Gold Challge. Trophy Total race	2-49-27		Not	measu	red for	rating		
Adelew.....	F. L. Salomon, Rockaway Park Y. C.	45 naut.	Tamaqua Yacht Club	1 Cruiser	5-31-54	4	4 x6	500	12.57	39.08	10.41	34.38
Viva.....	A. Pettit, Tamaqua Yacht Club	45 naut.	Tamaqua Yacht Club	1 Cruiser	5-26-42	3	6½x7	420	24.38	41.0	15.44	35.20
Victory II.....	H. A. Jackson, New York Ath. Club	45 naut.	Tamaqua Yacht Club	1 Cruiser	5-16-04	4	4¾x5½	575	15.84	35.77	9.12	35.00
Ruthie.....	F. Doebeli, Bergen Beach Y. C.	45 naut.	Tamaqua Yacht Club	1 Cruiser	6-16-33	2	5¾x6	450	9.74	30.67	9.24	30.70

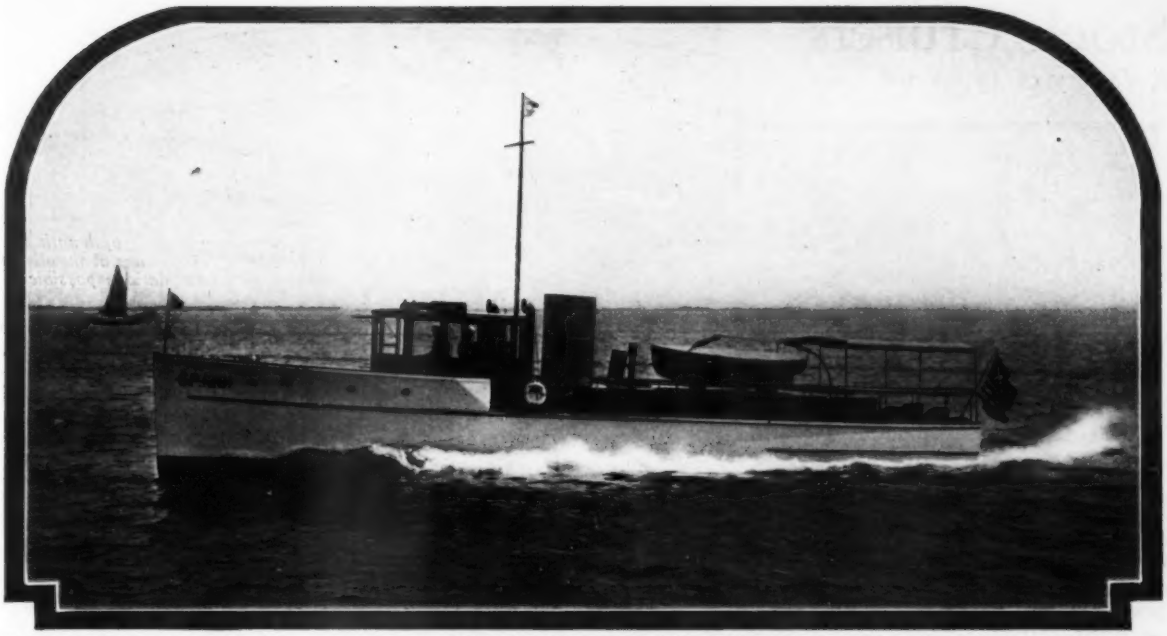
In addition to the races listed above, which were run under the sanction of the American Power-Boat Association, numerous other races were run during the year. The principal ones of these, all long-distance cruiser events, are mentioned here.

The New York Albany and Return Race of 870 statute miles was won by Maybelle V, H. C. Vaughan, in 36-10-30.

The Garic Cup Race, New Orleans to Pensacola, 190 statute miles, won by Brenda II, H. C. Fox, in 9-29-10.

Scripps Trophy Race, won by Josephine, E. H. Scott, 112 statute miles, 11-33-35.

Rockaway Beach to Poughkeepsie and Return—180 statute miles; Class A, won by Bedouin, L. H. Straus, in 17-03-00. Class B, won by Virginia, A. Benkamp, in 21-10-05.



Snark, 62x11 feet by 3 feet 6 inches, was designed by A. L. Swasey and N. G. Herreshoff, and built by the Herreshoff Mfg. Co. Owned by Carll Tucker of New York City. Powered with two Model FS eight-cylinder, 180-200 h.p. Sterling motors

Snark Erstwhile War Ship Back in Cits

SNARK is one of the eight famous Herreshoff flyers which were constructed in 1918 for patrol service by members of the Eastern Yacht Club, Marblehead, Mass. These vessels were the subject of considerable comment at the time, having several unusual features, but the details were suppressed by the censor.

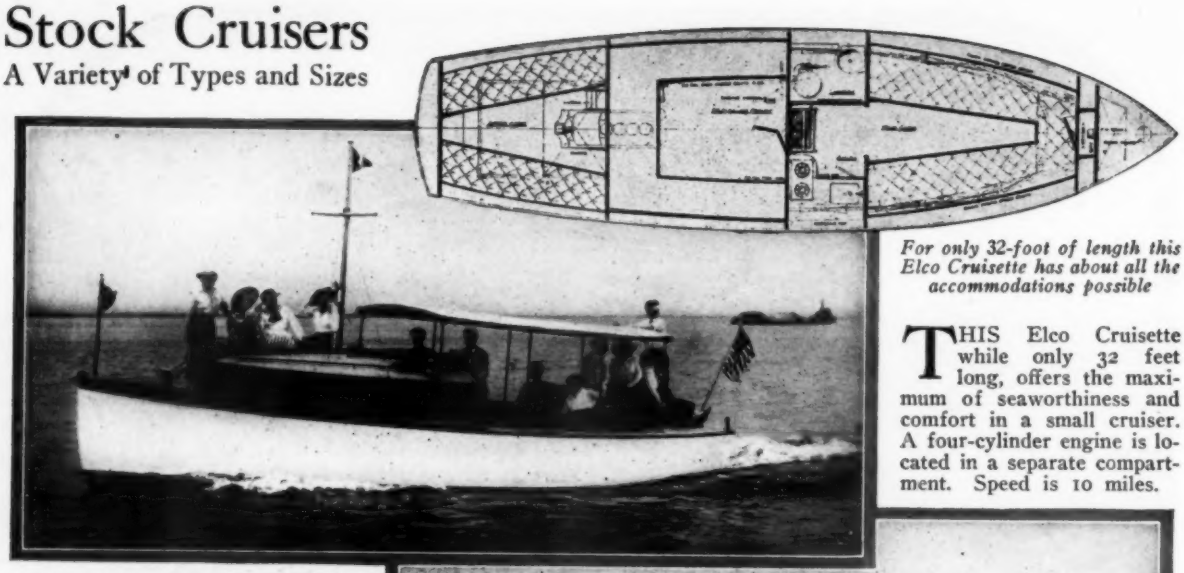
Snark is a 62-footer with 11-foot beam and 3-foot 6-inch draft. She represents the best product of the Herreshoff yards, and was designed by A. L. Swasey and N. G. Herreshoff. The combined efforts of these premier designers produced exceptionally fast and able vessels, which readily exceeded the estimated speed for which the boats were built.

The twin Sterling motors are of the high-speed type, developing a total of 400 h.p., and a resulting speed of 35½ m.p.h.

Views of the two Sterlings, the cabin and the after deck

Stock Cruisers

A Variety of Types and Sizes



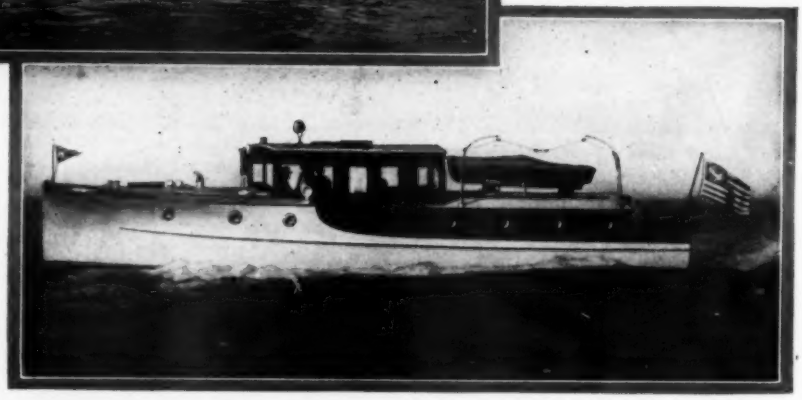
For only 32-foot of length this Elco Cruisette has about all the accommodations possible

THIS Elco Cruisette while only 32 feet long, offers the maximum of seaworthiness and comfort in a small cruiser. A four-cylinder engine is located in a separate compartment. Speed is 10 miles.

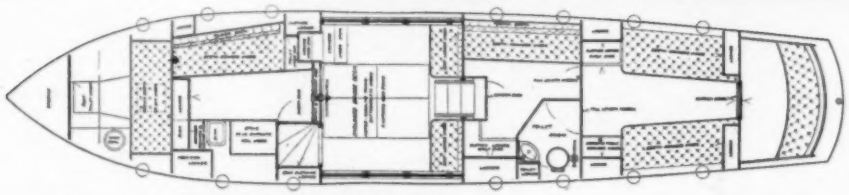
An idea of the number of people it is possible to carry without discomfort on the Elco Cruisette

AS the enclosed auto is to the open car so is the enclosed bridge deck of this 45-foot Rochester stock cruiser to the ordinary cruiser. Anyone having had experience on a boat with an enclosed bridge of this type would never be satisfied with the generally used canvas side curtains.

The plans below give one an excellent idea of the interior arrangement.



An entirely enclosed bridge deck is a distinctive feature of this Rochester 45-foot express cruiser

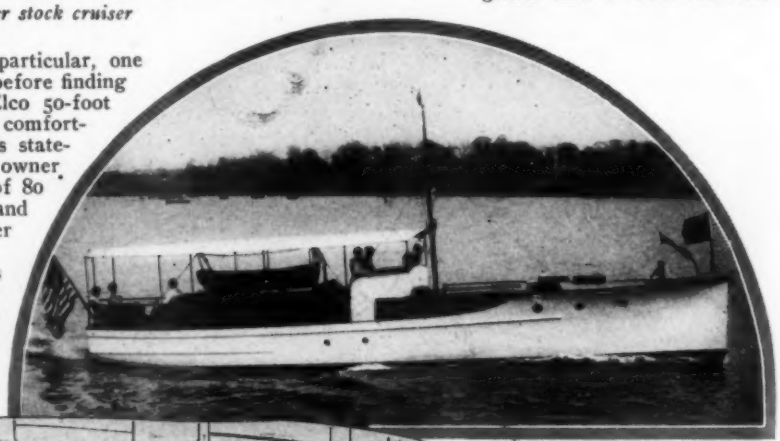


Arrangement plan of 45-foot Rochester stock cruiser

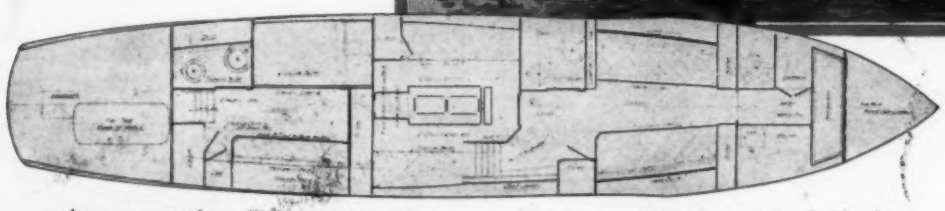
This boat will accommodate six men and a crew for a stag party, or a family party of owner and wife, two or three guests and a maid and crew.

THOROUGHLY tested in every particular, one would have to travel many miles before finding a boat as satisfactory as this Elco 50-foot standardized cruiser. These boats are comfortable and seaworthy. A private owner's stateroom offers every convenience to the owner when cruising. A six-cylinder motor of 80 h.p. equipped with electric starter and lighting plant drives the boat at better than 13 miles.

She is not of the ordinary express cruiser type in any sense but equipped with a slow-speed motor which is so popular for boats of this type.



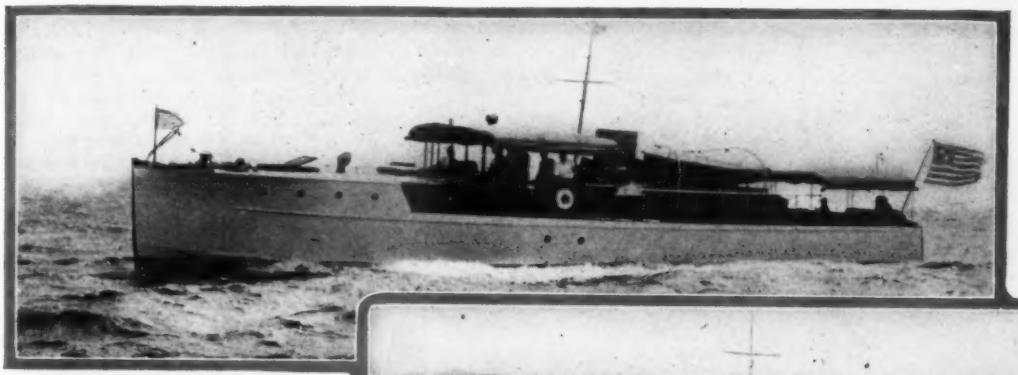
The attractive appearance of this 50-foot Elco Standardized Cruiser is noteworthy



Arrangement plan will give an idea of the amount of space available in a craft of this size

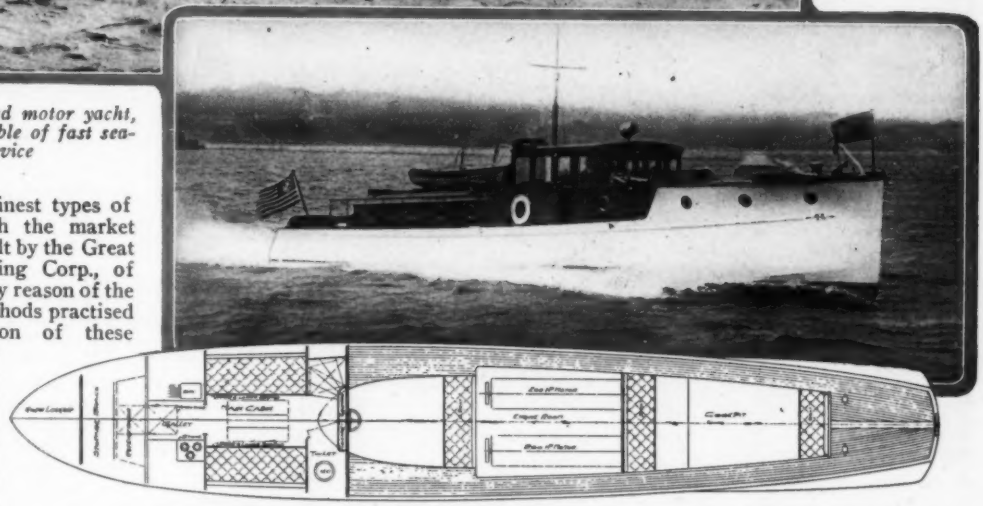
High-Speed Great Lakes Express Cruisers

Some Typical Examples of Fast Yachts as Developed by the Great Lakes Boat Building Corp.

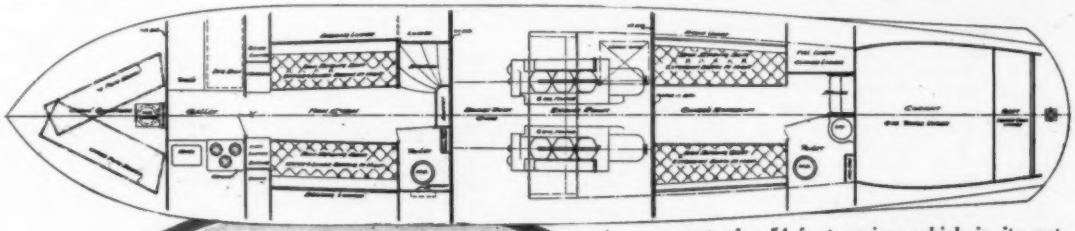


This large high-speed motor yacht, 76 feet long, is capable of fast seagoing service

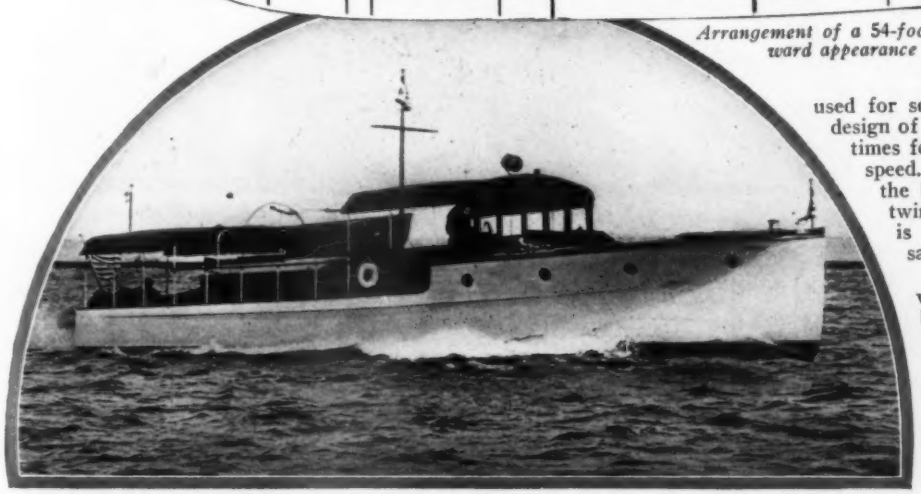
SOME of the finest types of cruisers which the market affords are built by the Great Lakes Boat Building Corp., of Milwaukee, Wis. By reason of the standardization methods practised in the construction of these boats, it is possible to secure a duplicate of any of the earlier examples and be assured of a successful performance after the boat is delivered. Every available foot of space is used for some useful purpose. The design of all shows the trend of the times for bridge control and high speed. Power plants suited to the boats are installed and a twin screw outfit of this kind is thoroughly reliable and satisfactory.



A fast cruiser, 60 feet long, similar to one just delivered to Webb Jay, Chicago, equipped for one-man control with accommodations for six or eight persons



Arrangement of a 54-foot cruiser which in its outward appearance is like the 52-foot boat

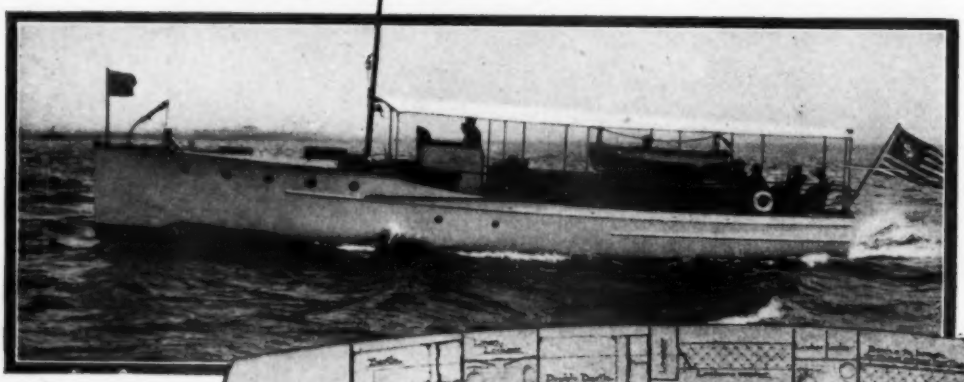


Fifty-two-foot Great Lakes express cruiser. Note the glass-protected bridge, very comfortable especially on a stormy day

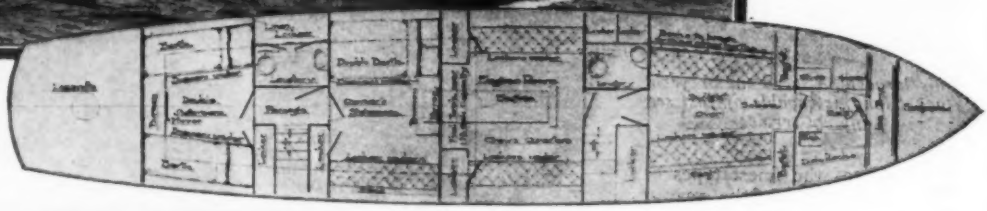
Accommodations will also vary with the size of boat but in every case are ample to take care of a sizable party and crew on an extended cruise. For day trips and week-end excursions, the large bridge decks and cockpit spaces afford room for many guests. A choice of power plants is permitted to suit the owner.

Some Popular Boats

Examples of what Is Possible in Boats of Moderate Size



This 56-foot Elco cruiser offers a maximum of seaworthiness, comfort, and efficiency. An owner's as well as a guest's stateroom is provided. A six-cylinder, 80 h.p. engine drives the boat at a speed of 13 miles.



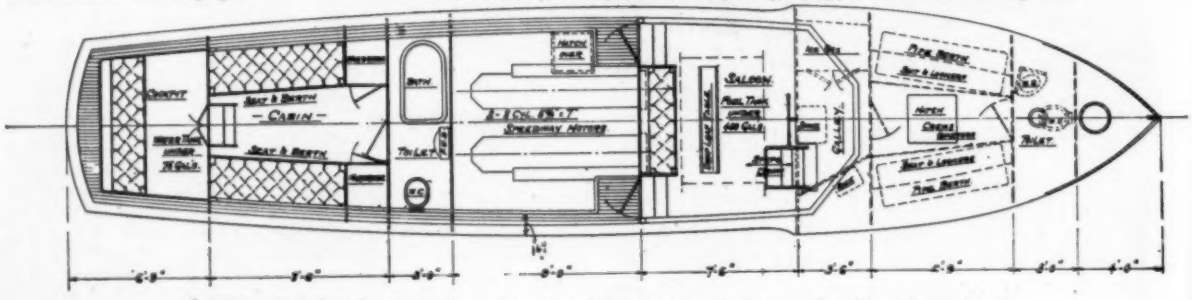
Fifty-six-foot standardized Elco cruiser. Thoroughly tried in every particular

A standardized stock boat being built by the Consolidated Shipbuilding Corporation is shown below. All of the attractive features of the most modern designs have been embodied in this boat. The owner has a private stateroom with two berths, the dining saloon also accommodates two berths and there is ample space for numerous day guests. The motor is installed in a well ventilated engine-room with full head room. Electric light is used throughout with the most modern fixtures and accessories.

A 40-foot express cruiser designed by Wm. H. Hand, Jr., of New Bedford. Similar to the earlier Countess models, powered with a 200 h.p. Sterling motor. She was built at Mystic, Conn., by F. G. Post for K. L. Greene

Of considerable advantage for the motor boat tourist is a boat of this type. Capable of doing a real 30 miles, a tourist can cover a matter of 200 odd miles per day with every possible comfort. Wm. H. Hand, Jr., her designer, used a duplicate and thoroughly tested every feature of her motor installation and equipment.

An ideal Speedway yacht, completely equipped and substantially built



Arrangement plan for a similar cruiser to the one pictured above. Considerable variety is possible in the arrangement of a boat of this size

My Ideal Auxiliary

No. 11, Chester—A 35-Foot Yawl

By A. R. Cochran

"MY Ideal Auxiliary" is very clearly defined in my mind. First, she must be seaworthy and able—staunch enough to withstand the most severe blow she might encounter. Second, she must be small; yet large enough to accommodate comfortably a party of four on an extended cruise without undue crowding. Four is my limit; when that number is exceeded a quiet comfortable cruise becomes a bedlam of dissention and wrangling. The smaller the party, the better. Then, too, the greatest joy is obtained in sailing a boat from thirty to forty feet long. And when one considers the cost of upkeep of a boat in these days, it behooves him to build as small as his purpose will permit. Third, she must be reasonably fast and easy to handle, for who cares to see the rest of the fleet walking past him? And it spoils the cruise to have to call all hands to 'bout ship. Good looks make up the fourth point, although seaworthiness and strength should not be sacrificed either to speed or appearance.

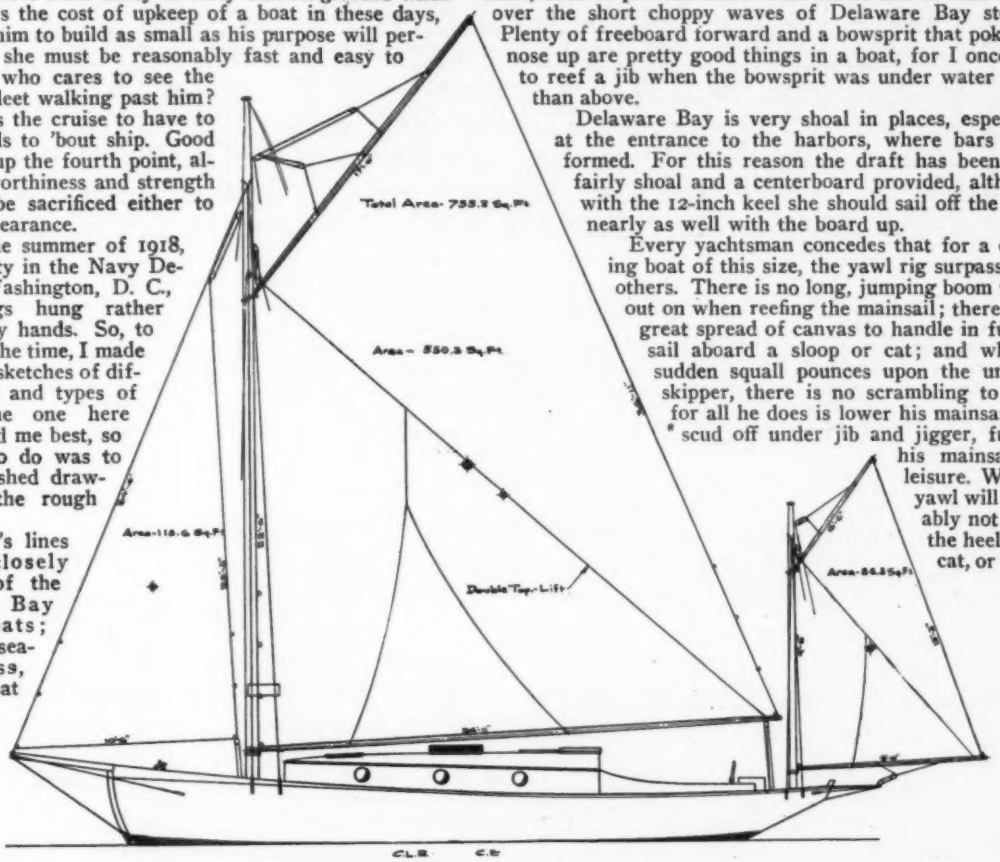
During the summer of 1918, while on duty in the Navy Department, Washington, D. C., the evenings hung rather heavy on my hands. So, to while away the time, I made some rough sketches of different sizes and types of yachts. The one here shown suited me best, so all I had to do was to make a finished drawing from the rough sketches.

The boat's lines resemble closely the lines of the Delaware Bay oyster boats; and for seaworthiness, you can't beat 'em.

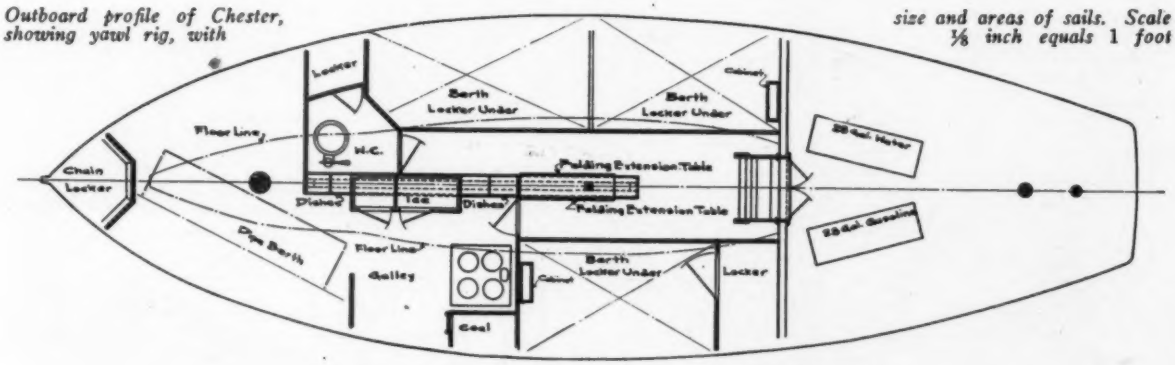
For sometime I have had a pet theory that an outward flare in a yacht's forward sections would give her a reserve buoyancy in riding heavy seas, allowing her to cut through the waves without pounding and without taking water over her bows. I have observed this in the oyster boats mentioned above and in nearly all deep-water sailing vessels. At the same time, it gives lots of deck room forward. I have tried to give her an easy entrance and run aft to aid in her sailing qualities. Overhangs forward and aft are fairly short, both to provide more room inside and to ride easily over the short choppy waves of Delaware Bay storms. Plenty of freeboard forward and a bowsprit that pokes its nose up are pretty good things in a boat, for I once had to reef a jib when the bowsprit was under water more than above.

Delaware Bay is very shoal in places, especially at the entrance to the harbors, where bars have formed. For this reason the draft has been kept fairly shoal and a centerboard provided, although with the 12-inch keel she should sail off the wind nearly as well with the board up.

Every yachtsman concedes that for a cruising boat of this size, the yawl rig surpasses all others. There is no long, jumping boom to lay out on when reefing the mainsail; there is no great spread of canvas to handle in furling sail aboard a sloop or cat; and when a sudden squall pounces upon the unwary skipper, there is no scrambling to reef, for all he does is lower his mainsail and scud off under jib and jigger, furling his mainsail at leisure. While a yawl will probably not show the heels of a cat, or sloop,



Outboard profile of Chester, showing yawl rig, with size and areas of sails. Scale ⅛ inch equals 1 foot



Arrangement plan of Chester. Scale 3/16 inch equals 1 foot

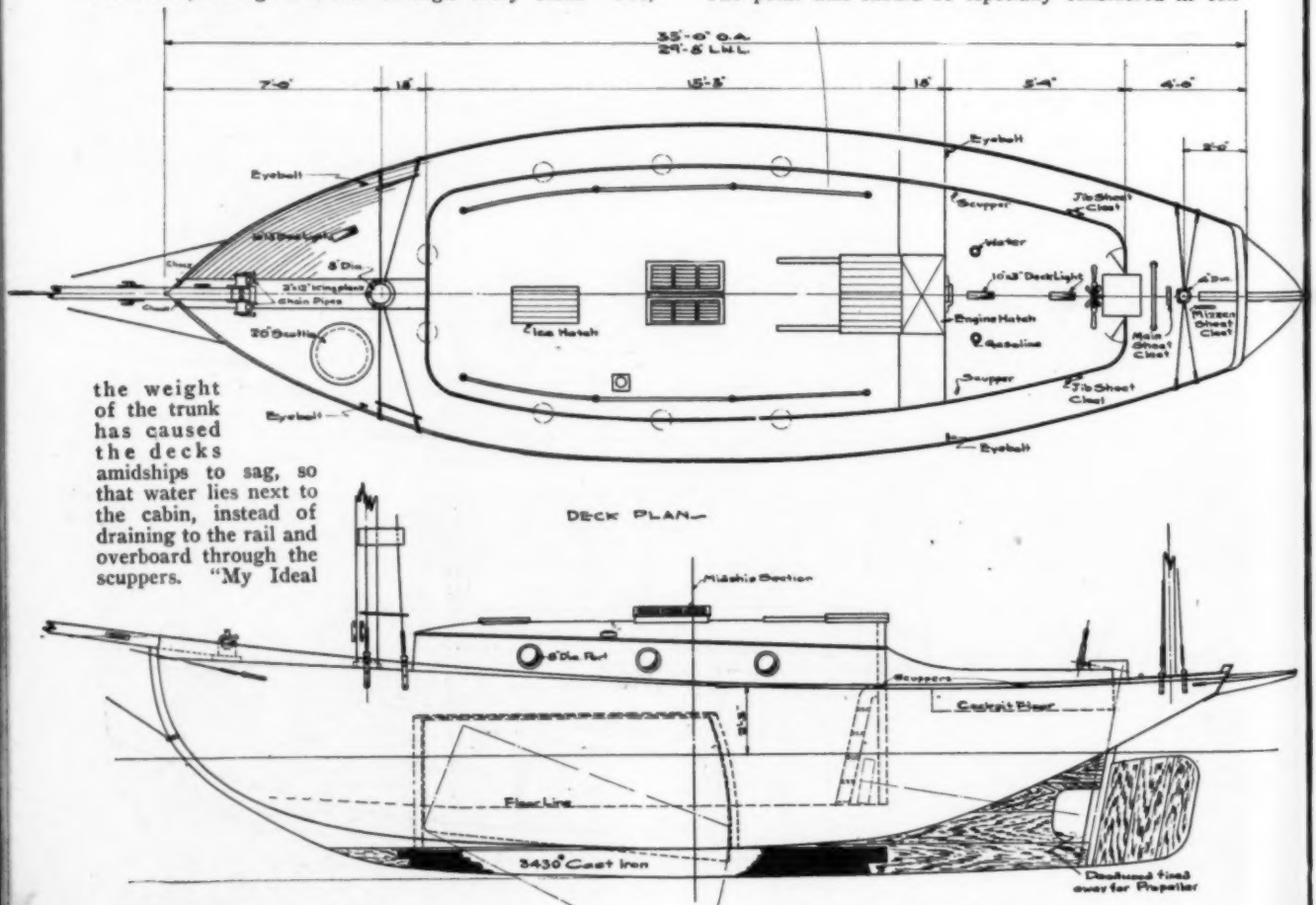
OFFSETS. (To Outside of Planking)																
		Stem	1	2	3	4	5	6	7	8	9	10	11	12	13	Transom
Heights	Rabbet of Keel		2'-8"	15 3/4"	6 1/2"	3"	1 1/8"	3/4"	0"	3/4"	1"	1 1/2"	2 1/2"	3 5/8"		
	Edge of Rabbet		3'-0"	23"	17 3/8"	14 3/4"	13 1/8"	12 3/4"	12"	12 3/4"	13 1/4"	19 5/8"	2'-6"	3'-7"	4'-9 3/8"	5'-9"
	A		4'-7 7/8"	2'-7 1/2"	2'-0 1/2"	21"	19 1/4"	18 1/8"	17 7/8"	18 3/4"	20 3/4"	2'-2 3/4"	3'-0 5/8"	4'-0"	5'-0 1/2"	5'-10"
	B		7'-7 1/2"	3'-8 1/2"	2'-7 1/2"	2'-1 7/8"	2'-2 1/4"	2'-1 3/4"	2'-0 3/4"	2'-1 1/8"	2'-4 1/2"	2'-10 1/8"	3'-7 7/8"	4'-4 1/2"	5'-3 1/8"	6'-0"
	C			6'-5 1/8"	3'-8 1/8"	2'-10 1/8"	2'-8"	2'-7 1/8"	2'-6 1/2"	2'-7 1/8"	2'-11 1/4"	3'-6 5/8"	4'-3 1/2"	5'-0 1/2"	5'-11"	
	D				6'-4 1/8"	3'-9"	3'-3 1/2"	3'-1 3/4"	2'-11 1/2"	3'-2 3/8"	2'-7 1/2"	4'-3 5/8"	5'-1 1/2"			
	E						4'-9 1/8"	4'-1"	3'-11 1/2"	4'-2"	4'-10 1/8"					
	Deck	7'-8"	7'-1 1/8"	6'-11 1/2"	6'-10"	6'-8 1/2"	6'-6 7/8"	6'-5 1/2"	6'-3 7/8"	6'-3 1/4"	6'-2 5/8"	6'-2 1/4"	6'-2 1/2"	6'-2 3/4"	6'-4 1/2"	6'-5"
	Sheer Line	8'-0"	7'-8 5/8"	7'-5"	7'-1 5/8"	6'-11 1/4"	4'-3 1/8"	6'-7 1/8"	6'-5 1/8"	6'-4 3/4"	6'-3 3/8"	6'-3 3/4"	6'-4"	6'-4 3/4"	6'-3 5/8"	6'-0 1/2"
Half Breadths	Keel	3/4"	3/4"	2"	3 1/4"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	3 1/2"	2"		
	W.L.4			4"	11 3/8"	17 1/2"	21"	23"	23 1/8"	21 1/8"	16 3/8"	5"				
	W.L.3		2 3/4"	18 7/8"	2'-7 1/8"	3'-3 1/4"	3'-7 1/8"	3'-9 1/8"	3'-10 1/4"	3'-7 1/8"	3'-0 1/8"	2'-2"	11 3/8"			
	L.W.L.		9 3/4"	2'-2 3/8"	3'-4 1/2"	4'-2 1/8"	4'-8 1/4"	4'-11 1/4"	5'-0"	4'-10 1/8"	4'-5"	3'-8 1/8"	2'-7 1/2"	12"		
	W.L.2		13 1/8"	2'-7"	3'-8 1/8"	4'-6 1/8"	5'-1"	5'-4 1/2"	5'-5"	5'-3 1/8"	5'-0 1/8"	4'-6 3/4"	3'-10 1/8"	2'-11 1/8"	13 3/8"	
	W.L.1		16"	2'-9 1/2"	3'-11"	4'-8"	5'-0 1/8"	5'-5"	5'-6"	5'-5"	5'-2 1/8"	4'-11"	4'-5 1/4"	3'-9 1/8"	3'-0 1/2"	2'-0 1/8"
	Sheer Line	1"	2'-0 1/2"	3'-4"	4'-3"	4'-10 1/2"	5'-3 1/4"	5'-5 1/8"	5'-6"	5'-5 1/8"	5'-3"	4'-11"	4'-5 1/8"	3'-9 1/8"	2'-11 1/8"	2'-1 1/8"

Table of offsets for building auxiliary yawl

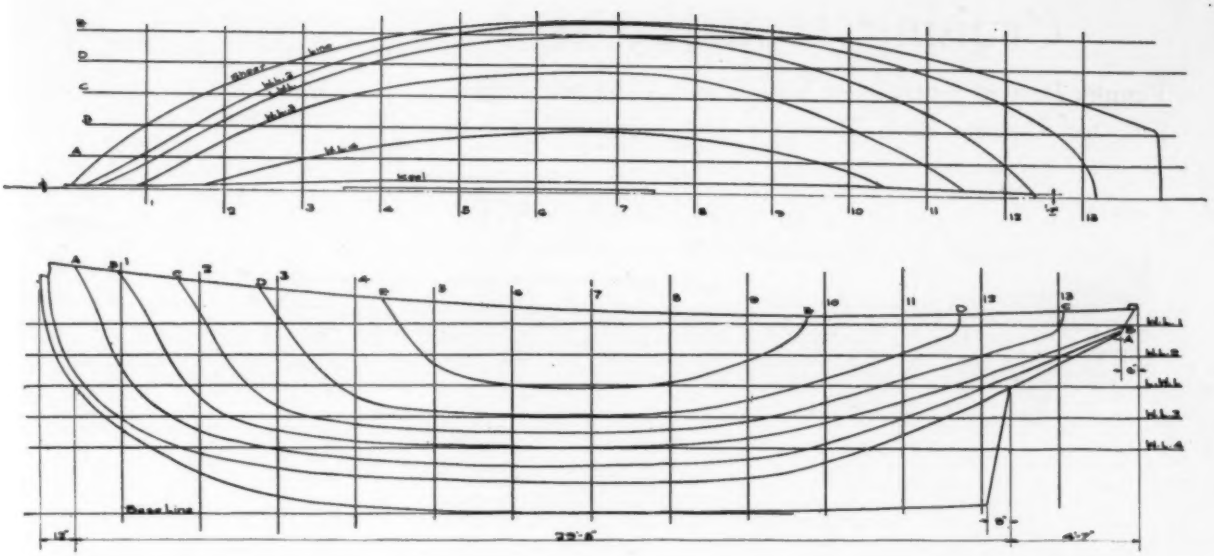
for handiness, which after all is the all-important feature in a cruiser's rig, the yawl heads the list.

I am part owner of a 33-foot sloop. She is of extra heavy construction and yet, in a seaway or heavy wind, she works, taking in water through every seam. Too, the weight of the trunk has caused the decks amidships to sag, so that water lies next to the cabin, instead of draining to the rail and overboard through the scuppers. "My Ideal Auxiliary" is heavily constructed throughout and is able to laugh at the buffets of Father Neptune. Heavy knees at each frame under the cabin stiffen the structure and prevent sagging of the decks.

One point that should be especially considered in con-

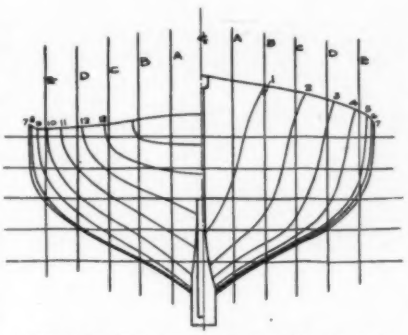


Deck plan and profile showing some construction details of Chester. Scale 3/16 inch equals 1 foot

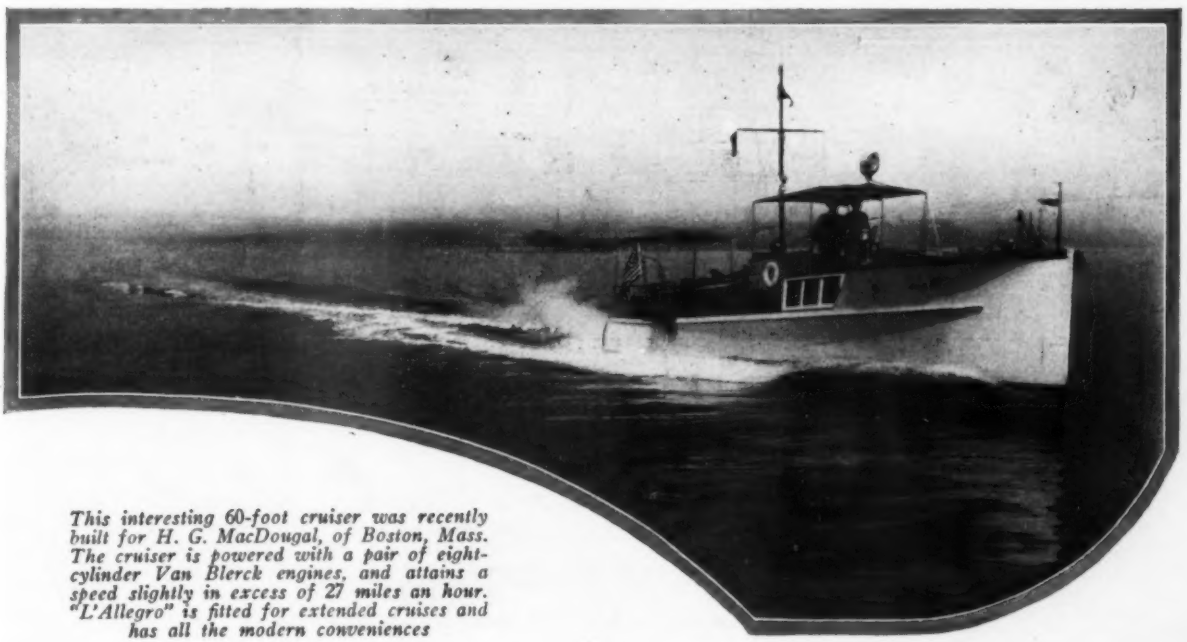


structing a cabin is water-tightness. Rain drives through the cabin sides of my sloop, and I am at present engaged in covering them with canvas, lapping the upper edges under the canvas on the cabin top and fitting the corners with quarter-round oak. The same scheme has been incorporated in "My Ideal Auxiliary." Nothing is more disagreeable than a wet cabin.

The interior arrangement and equipment include everything necessary to the comfort and convenience of the party. There is enough space to move around, both below and above decks. The cockpit is self-bailing and large enough, without taking too much from the cabin. A raised deck covers the engine, which is thus kept out of the cabin and at the same time is easily accessible. The berths are all of canvas with pipe frames, being much more comfortable than wood. Those in the cabin swing upward to give access to the lockers beneath; that in the forecastle folds up against the frames when not in use. There is a roomy gallery with a Shipmate for use in cold or rainy weather. For summer a small alcohol or gasoline stove may be placed on top of the Shipmate. I have found this arrangement very advantageous. The ice-box is a novel feature. Built on top of the centerboard well, the ice is put in through a hatch on the deck, eliminating the necessity of carrying it through the cabin. The drain leads directly into the well. Two doors open into the ice and food compartments. The toilet room, as may be seen, is on the starboard side, forward, and contains a Curtiss closet. I contemplated installing a lavatory, but my experience has been that everyone aboard a craft of this size prefers washing in a bucket on deck.



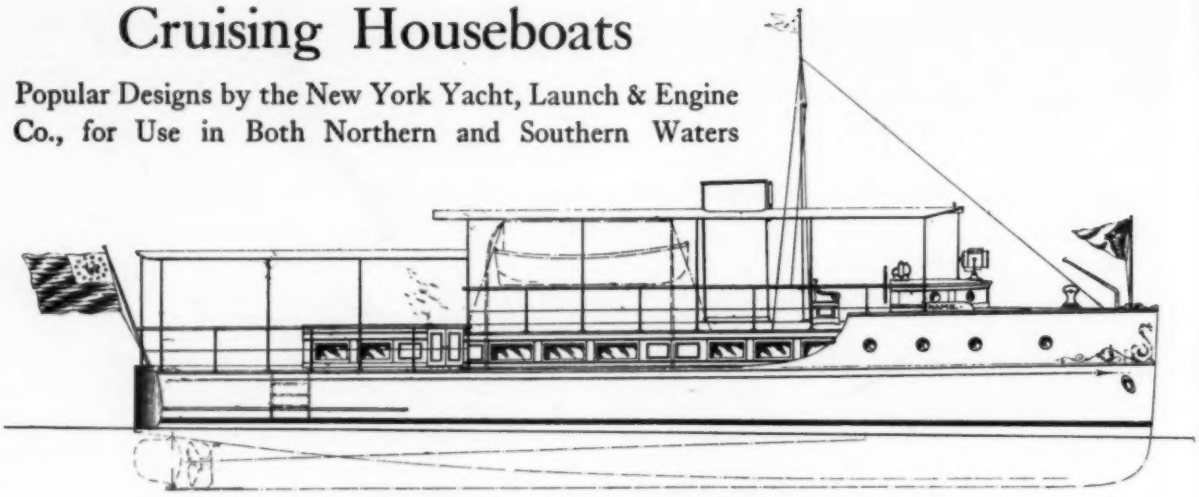
Lines in plan, profile, and section to outside of planking. Scale 3/16 inch equals 1 foot



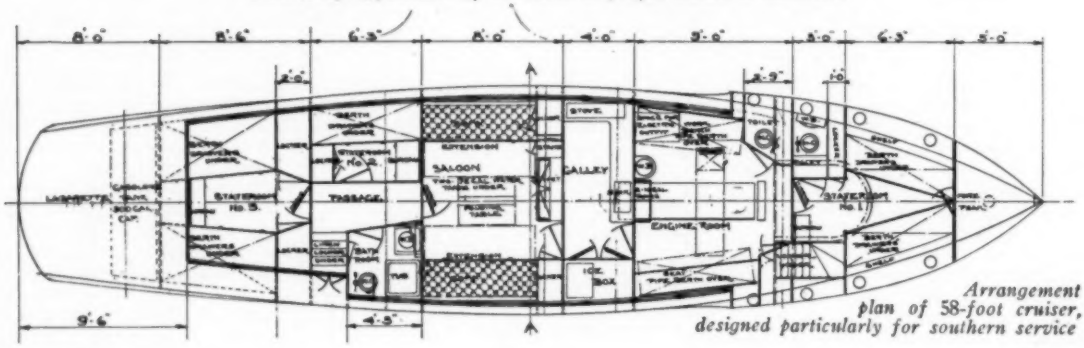
This interesting 60-foot cruiser was recently built for H. G. MacDougal, of Boston, Mass. The cruiser is powered with a pair of eight-cylinder Van Blerck engines, and attains a speed slightly in excess of 27 miles an hour. "L'Allegro" is fitted for extended cruises and has all the modern conveniences

Cruising Houseboats

Popular Designs by the New York Yacht, Launch & Engine Co., for Use in Both Northern and Southern Waters



Seaworthy appearance of this boat in profile makes it attractive

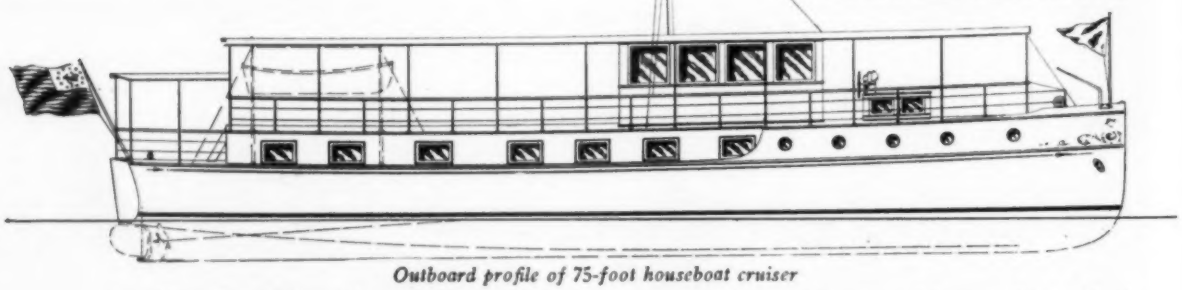


Arrangement plan of 58-foot cruiser, designed particularly for southern service

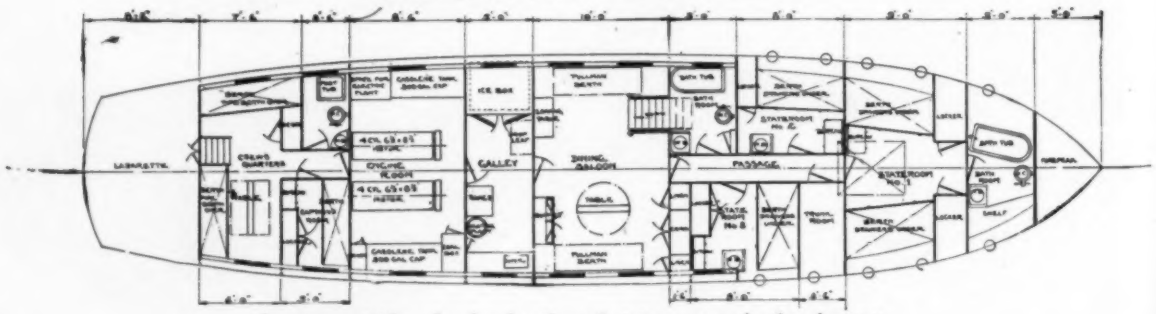
THE plans shown here are typical examples of the modern cruising houseboats as built and developed by the New York Yacht, Launch & Engine Co., of Morris Heights, N. Y. The smaller vessel 58 feet long is comfortably arranged, has three large staterooms, a very spacious saloon, and an excellent galley.

For a power plant a Twentieth Century engine is used which drives the boat along at a substantial turn of speed.

The larger boat below has more spacious accommodations and large crew's quarters and accordingly more comfortable and roomy. The power equipment here consists of a pair of four-cylinder 6½ x 8½ Twentieth Century motors which, together with auxiliary electric plant, etc., are located in a large engine-room aft.



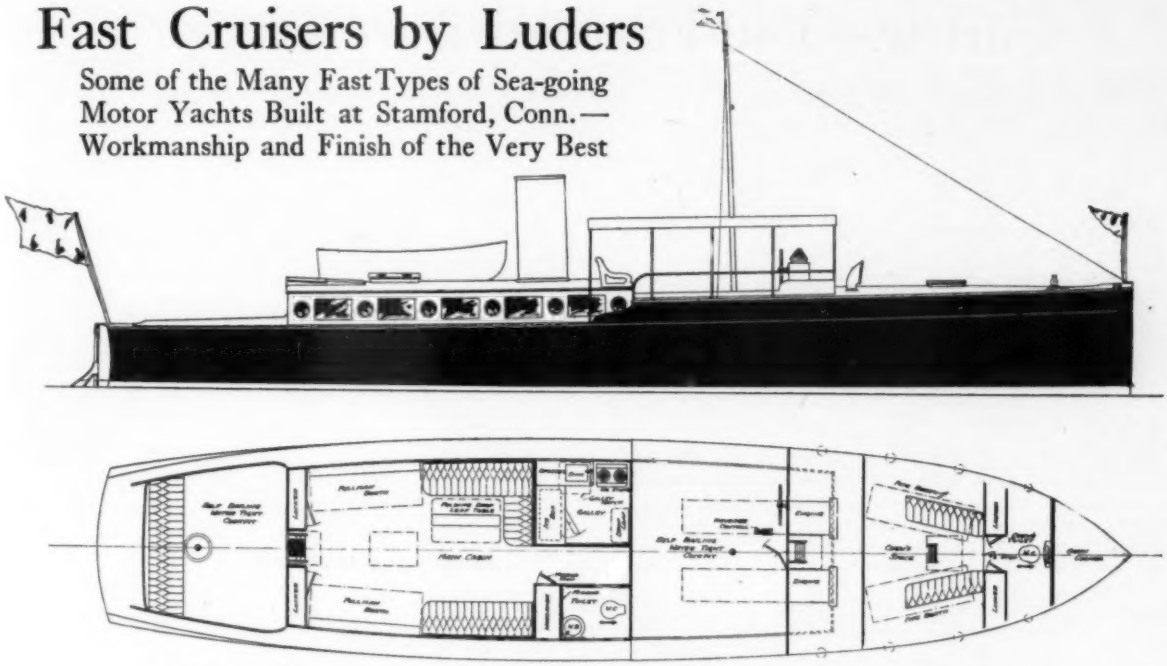
Outboard profile of 75-foot houseboat cruiser



Arrangement plan showing location of staterooms and other features

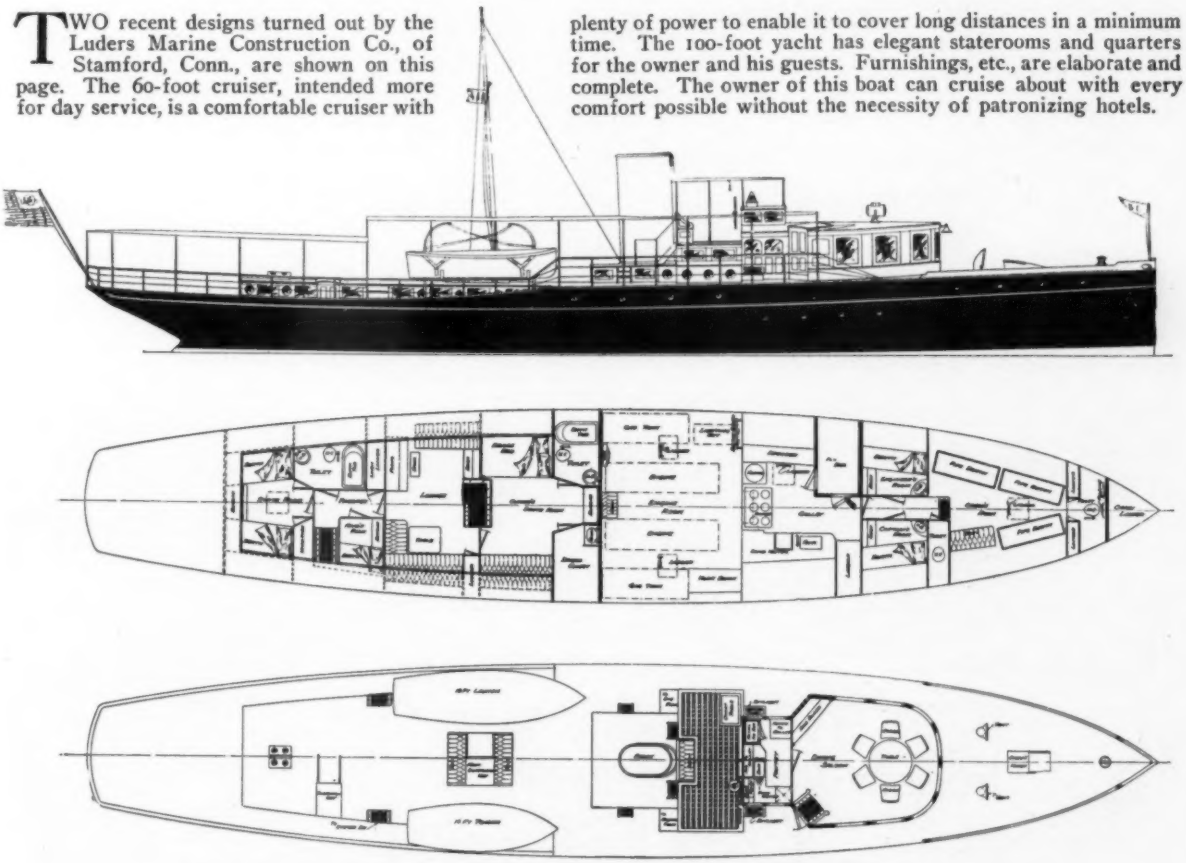
Fast Cruisers by Luders

Some of the Many Fast Types of Sea-going Motor Yachts Built at Stamford, Conn.—Workmanship and Finish of the Very Best



Profile and arrangement plan for a fast 60-foot day cruiser with ample accommodations for a cruising party

TWO recent designs turned out by the Luders Marine Construction Co., of Stamford, Conn., are shown on this page. The 60-foot cruiser, intended more for day service, is a comfortable cruiser with plenty of power to enable it to cover long distances in a minimum time. The 100-foot yacht has elegant staterooms and quarters for the owner and his guests. Furnishings, etc., are elaborate and complete. The owner of this boat can cruise about with every comfort possible without the necessity of patronizing hotels.



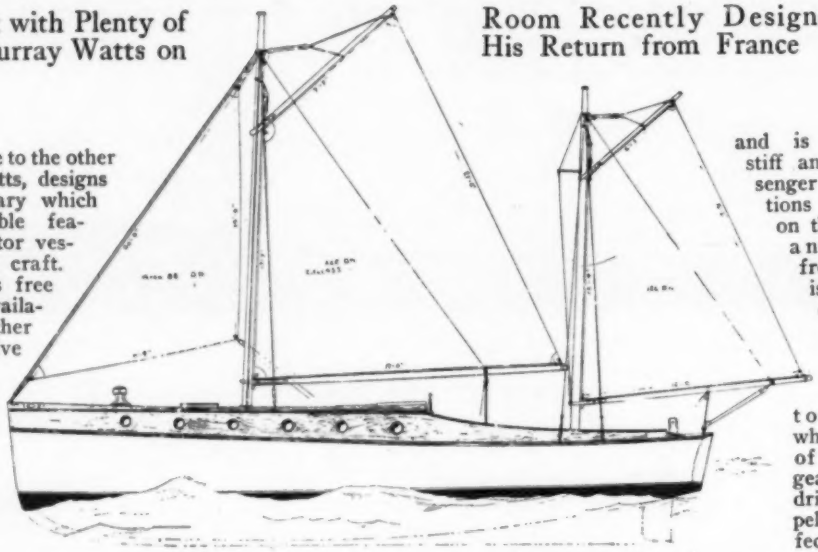
Profile and arrangement plans for a 100-foot cabin cruiser, suitable for use at the American Cup Races or anywhere on the high seas or inland waters

Curlew—a 40-Foot Auxiliary Cruiser

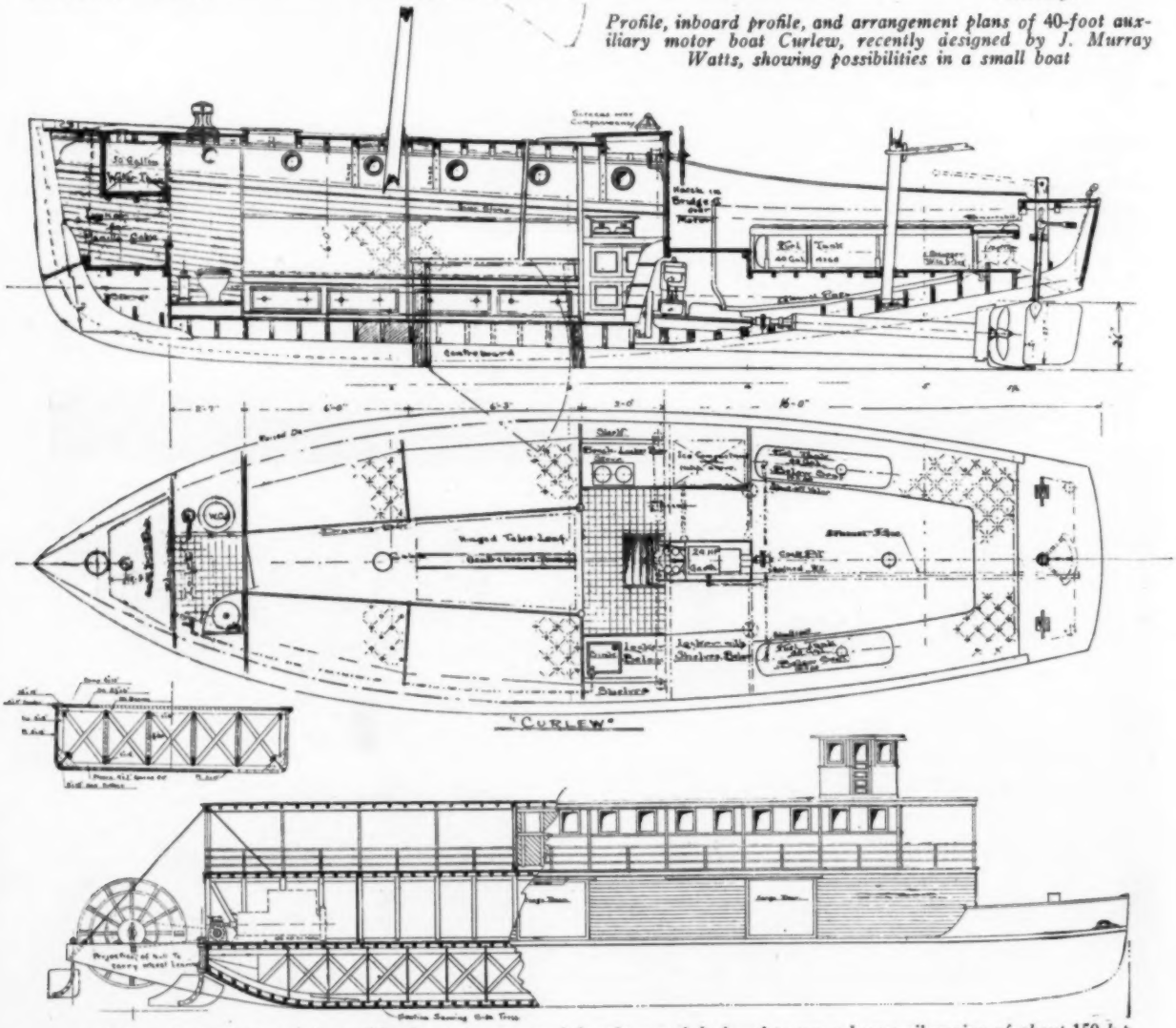
A Small Boat with Plenty of Room Recently Designed by J. Murray Watts on His Return from France

FROM one extreme to the other—J. Murray Watts, designs a 40-foot auxiliary which combines the desirable features of both the motor vessel and the sailing craft. Wind power which is free may be used when available, reserving for other occasions the expensive gasoline.

The stern-wheel boat is also a novel type intended for inland river service in shallow waters. The hull is built around longitudinal and transverse trusses and is exceptionally stiff and able. Passenger accommodations are provided on the upper deck and ample freight capacity is arranged for on the main deck. A heavy-oil engine is connected to the stern wheel by means of a reduction gear and chain drive, which propels the boat effectively.

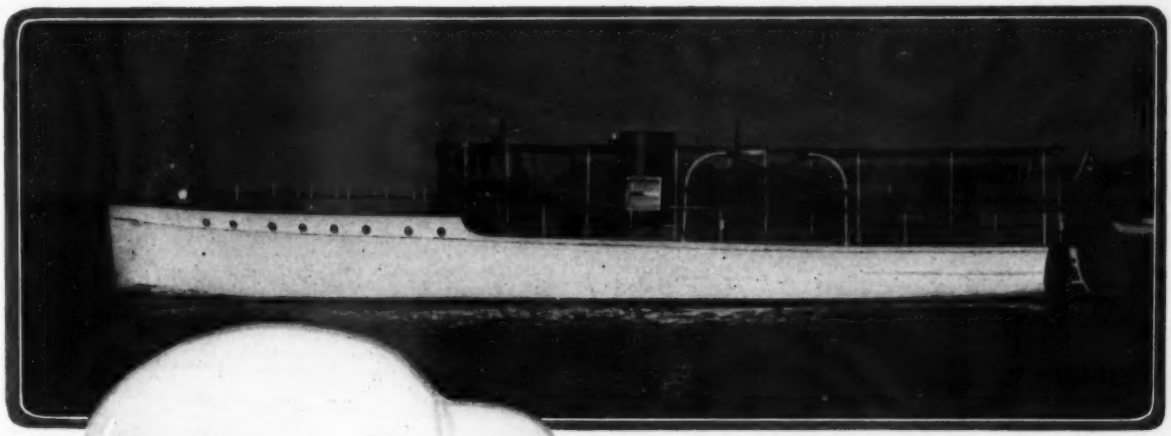


Profile, inboard profile, and arrangement plans of 40-foot auxiliary motor boat Curlew, recently designed by J. Murray Watts, showing possibilities in a small boat

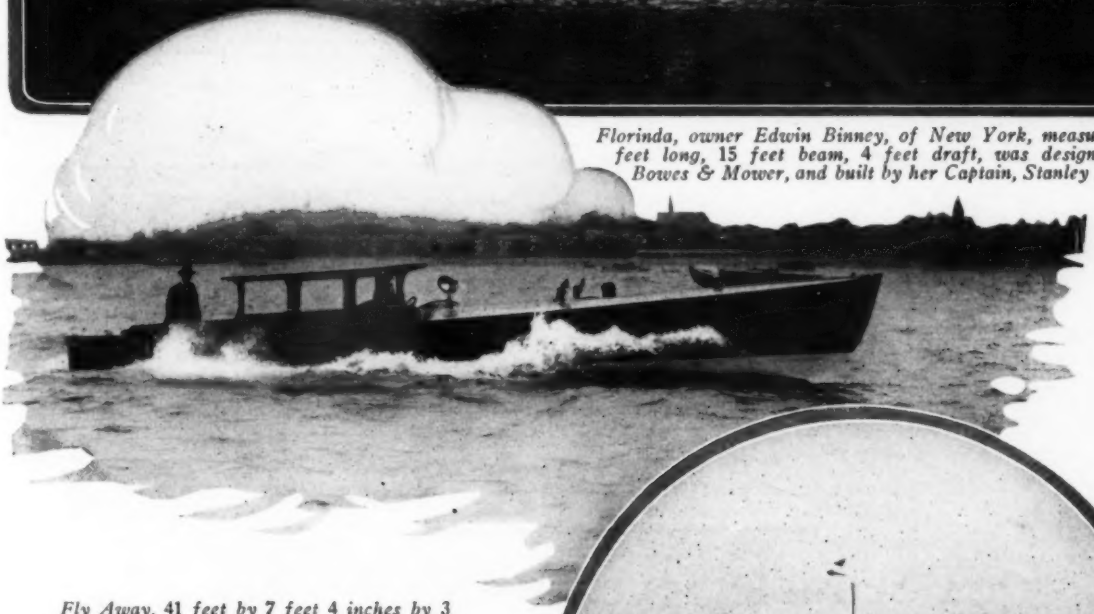


A shallow draft stern wheel, combination passenger and freight vessel designed to use a heavy-oil engine of about 150 h.p.

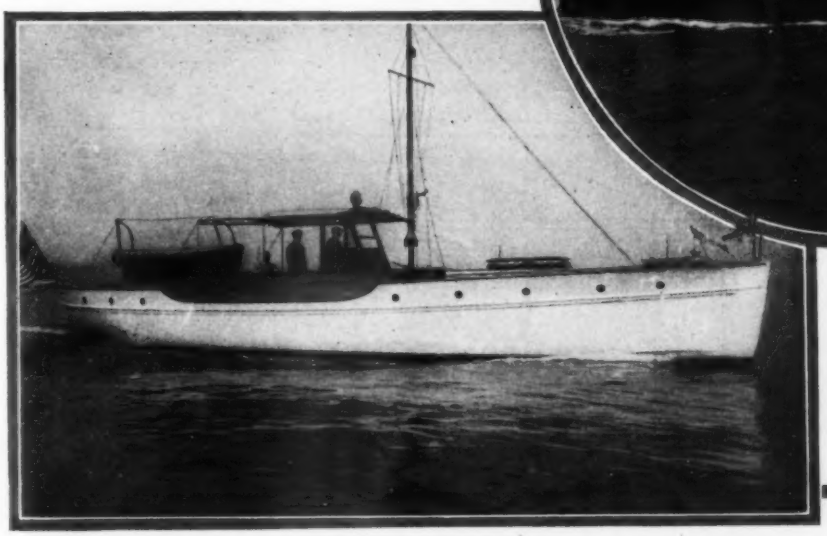
Four Modern Motor Craft Ready for 1920



Florinda, owner Edwin Binney, of New York, measures 72 feet long, 15 feet beam, 4 feet draft, was designed by Bowes & Mower, and built by her Captain, Stanley Ferris



Fly Away, 41 feet by 7 feet 4 inches by 3 feet runabout. Powered with a Model FS eight-cylinder, 200 h.p. Sterling motor, speed 30 m.p.h.



JaDa, owner Charles L. Harding of Boston, measures 56 feet 3 inches long, 11 feet 3 inches beam, 2 feet 9 inches draft. Twin six-cylinder Sterlings, bore 5½ inches, stroke 6¼ inches. 145 h.p. each at 1,400 r.p.m. drive her at over 24 m.p.h.

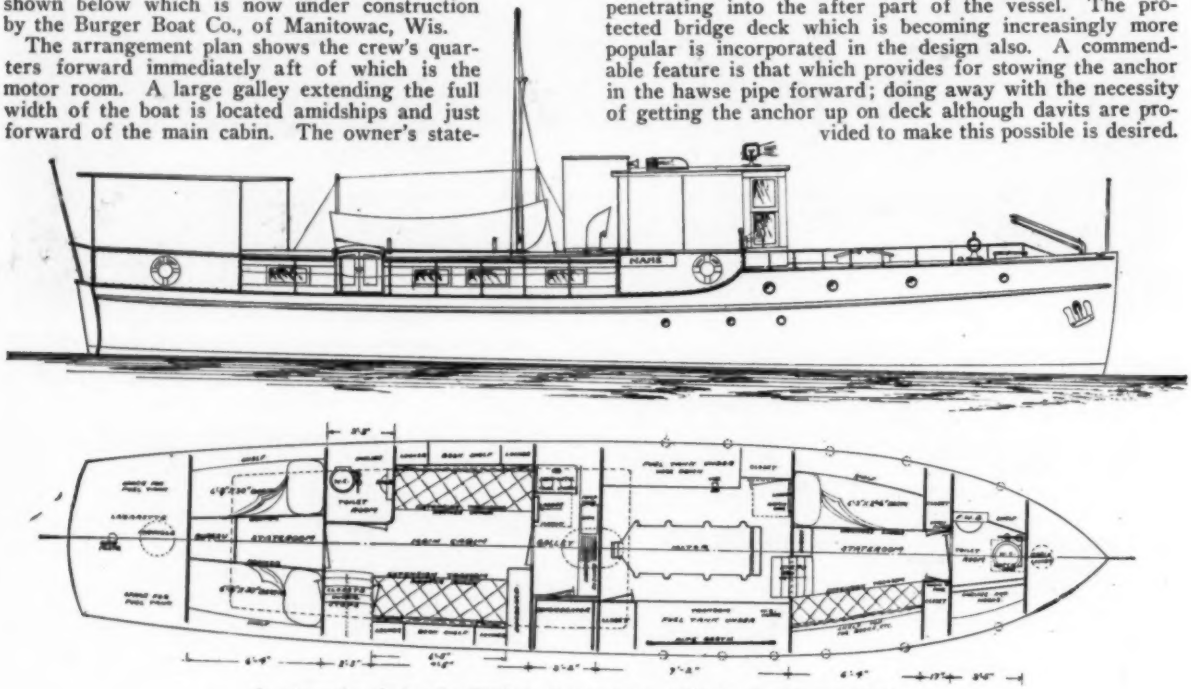
Seafarer II, 58 feet 7 inches overall, 53 feet 9½ inches waterline, 12 feet 1-inch beam, 3 feet 8¼ inches draft offshore cruiser, owned by L. H. Spaulding, of Boston, Mass. Powered with a Model FH six-cylinder 35-85 h.p. Sterling motor, speed 13 m.p.h.

An Eastern Design for a Westerner

WILLIAM J. DEED, JR., formerly of Boston but now designer for the International Shipbuilding & Marine Engineering Co. of Nyack, N. Y., recently produced the design shown below which is now under construction by the Burger Boat Co., of Manitowac, Wis.

The arrangement plan shows the crew's quarters forward immediately aft of which is the motor room. A large galley extending the full width of the boat is located amidships and just forward of the main cabin. The owner's stateroom is in the extreme stern of the boat. Access from deck to below deck can be made both forward and aft.

Several water-tight transverse bulkheads serve to stiffen the boat and also act to keep the heat and oil fumes from penetrating into the after part of the vessel. The protected bridge deck which is becoming increasingly more popular is incorporated in the design also. A commendable feature is that which provides for stowing the anchor in the hawse pipe forward; doing away with the necessity of getting the anchor up on deck although davits are provided to make this possible is desired.



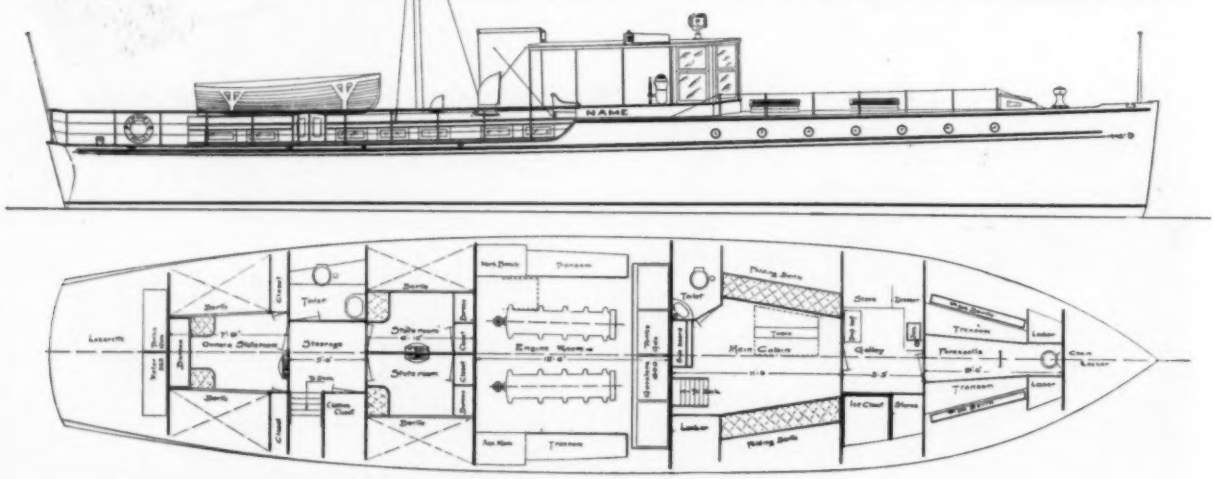
An attractive design by William J. Deed, Jr., built by the Burger Boat Co.

A Sensible Seventy-One Footer

CHARLES D. MOWER, who has recently been released from his war work in connection with boat and ship designing for the Bureau of Construction and Repairs and has established an office at 347 Madison Ave., New York, City, and has turned out a number of very excellent designs for 1920.

The plans below show a 71-footer of more than ordinary merit which is apparent by a close inspection of the plans. The tendency to enclosed bridges is being forced by a number of larger automobile manufacturers who have placed orders for boats for next year's delivery and on account of the popularity of the closed car today will listen to no arguments for other arrangements.

A description of the various good features of this craft is unnecessary as they will be observed from the plans.



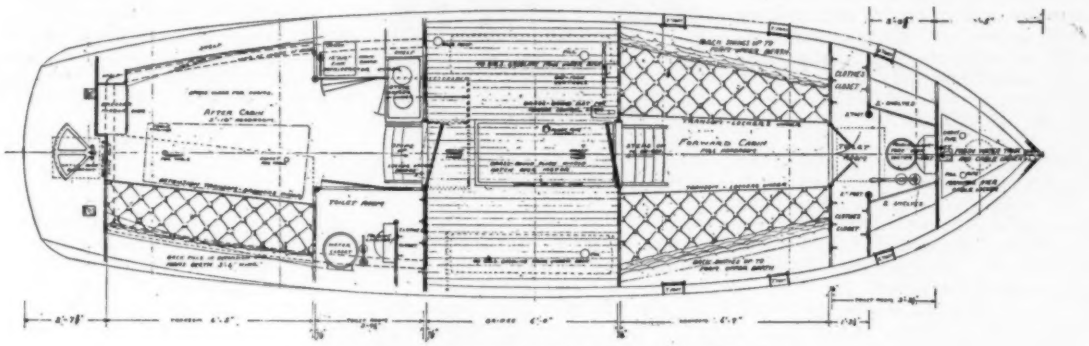
Charles D. Mower's design of a sensible 71-footer

A Stock Cruiser Which Anyone Can Afford

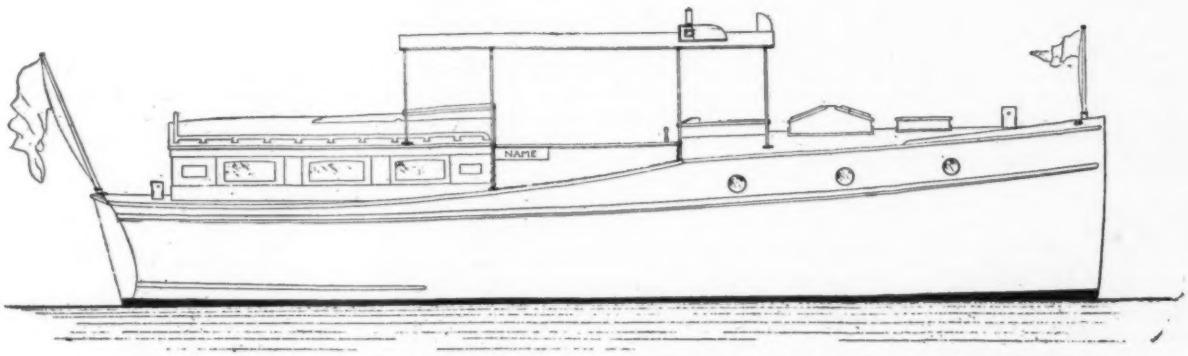
An Attractive Thirty-two Footer to Be Built in Quantity by the International Shipbuilding & Marine Engineering Corporation in Two Models—One a Bridge-Deck, the Other a Cockpit Design

CAN you get more in a 32-foot cruiser than the International Shipbuilding & Marine Engineering Corp., of Nyack, N. Y., gives in this trim craft? We doubt it. This boat is of their stock models, the hull being the same as that of their 32 x 9 x 3 foot raised-deck cruiser with the cockpit placed amidships and a trunk cabin added aft. The sheerline is changed slightly for appearance, but otherwise this is the same identical hull as that of the other type. The International corporation will build both types and market them at a moderate price, so that the average man may get a cruiser at modearte outlay and when delivered she will be ready for a cruise, requiring only that linen, food and supplies be put aboard.

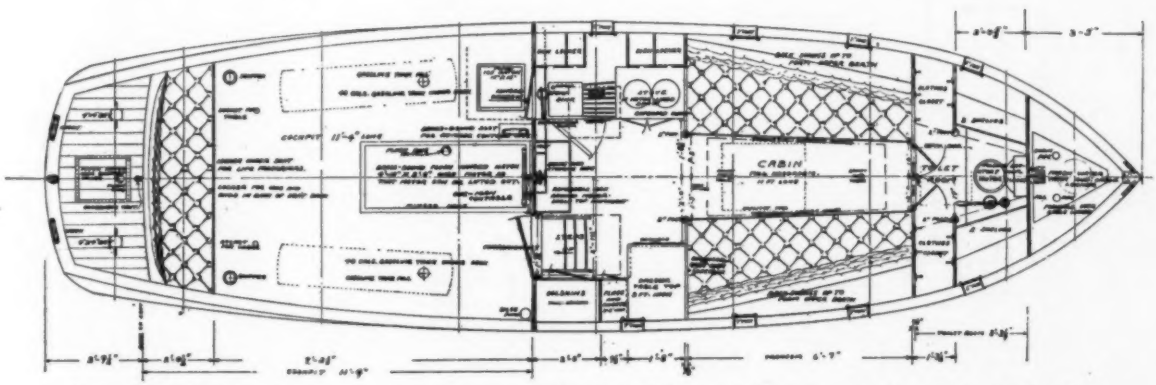
Two cabins are provided by this plan. Forward is a large cabin with toilet room 3 feet 3 inches long in the bow. In this forward cabin are two transoms, the upholstered backs of which swing up and form upper berths, so that we get four berths here, with plenty of locker room. The headroom is fully 6 feet here. Under a 6-foot cockpit or bridge is a 20 h.p. Kermath motor which will drive the boat 10 m.p.h., and on either side of the motor is a 40-gallon gasoline tank. Over the motor is a large hatch, large enough so that the motor can be lifted through it in case of need, should any major repairs be necessary.



Interior arrangement plan of the bridge-deck 32-footer



In outward appearance this design can hardly be improved upon in a boat of any length



If anyone can devise a better or more roomy arrangement in a 32-foot cockpit cruiser we have yet to see the plan

Open and Closed Circuit Battery Ignition

BATTERY ignition can be roughly divided into two general types—Open Circuit and Closed Circuit.

The Open Circuit type is generally operated on a set of dry cells. The Closed Circuit type is operated from a storage battery which is kept charged by the generator of the electric starting and lighting system.

As comparatively few marine engines have this electric starting and lighting, the Open Circuit type is employed by most motor boatmen.

The typical Open Circuit system consists of a *contact-maker,* which opens and closes the circuit, a *distributor* which distributes the sparks to the various plugs in the proper firing order, and an *induction coil,* which "steps up" the primary current to the high voltage required to jump the plugs under compression. A condenser is generally incorporated with the coil to make the "break" more abrupt and to act as a sort of "shock absorber" for the contact points.

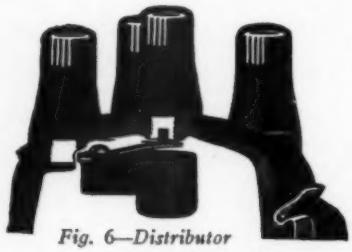


Fig. 6—Distributor

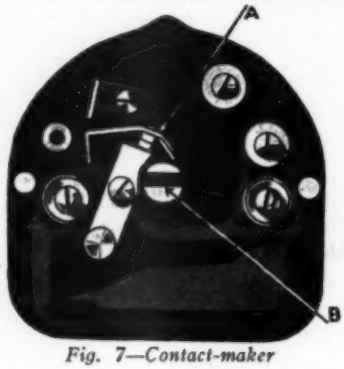


Fig. 7—Contact-maker

The "breaking" is accomplished in this way: A *notched shaft,* one notch for each cylinder, is rotated at one-half engine speed. A *lifter* is pulled forward by the notched shaft and then pulled back to its original position by the *lifter spring.* A *latch* and two *contact points* complete the device.

Figs. 1, 2, 3, 4 show the operation of this sort of contact-maker very clearly. In Fig. 1 the lifter is being pulled forward by the notched shaft. Fig. 2 shows the lifter about to be pulled back by the lifter spring. In returning the lifter strikes against the latch throwing it against the contact spring and closing the circuit for a *very brief* instant. In Fig. 4 the next notch is beginning to pull the lifter forward again. Note, that in this type of ignition the circuit is only closed during the very brief instant of the spark—no current can flow at any other time. This highly ingenious device greatly prolongs the life of the dry cells.

The high-voltage secondary current, set up in the induction coil by the breaking of the primary circuit, is carried to the distributor, Figure 6, and thence to the proper plug according to the firing order of the engine.

This system is highly economical because it is impossible to waste current by leaving the switch "on" while the engine is not running. Whenever the engine is at rest, the contact points are open and no current can flow.

The simplicity of the Open Circuit, battery ignition, is another point in its favor. The moving parts are few in number and are made accessible for adjustment and lubrication simply by lifting the contact-maker cover.

There is but one adjustment in the entire system and this can be made with a screwdriver. This simplicity of construction appeals particularly to the motor boatman who is usually his own repairman and wishes to handle his engine without sending for a high priced electrical expert.

Then, too, the hot, fat starting spark demanded by the present-day low-test gasoline can best be furnished by battery ignition. As the lifter spring always pulls back the lifter at the same speed, no matter how fast the engine is turning over, there is no danger of a weak starting spark or an overly hot spark in high speeds. This feature, peculiar to battery ignition, gives easy starting as compared to systems where the strength of the spark is dependent on engine speed. In the same way there is no danger of burning out the contact points by producing too hot a spark at racing speeds.

CLOSED CIRCUIT BATTERY IGNITION

The increasing number of marine engines equipped with electric starting and lighting has led to a corresponding increase in the use of Closed Circuit Ignition.

As the name implies, the circuit is always closed when

(*Continued on page* 68)

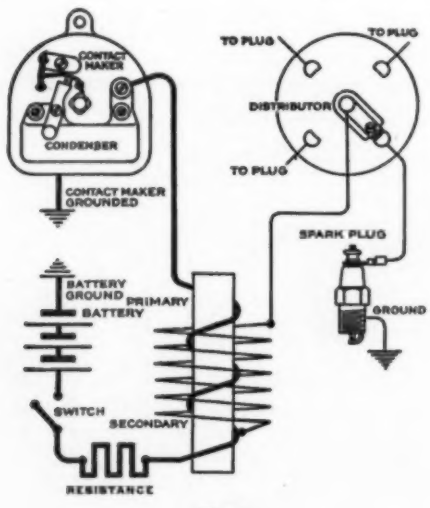


Fig. 5
Wiring connections

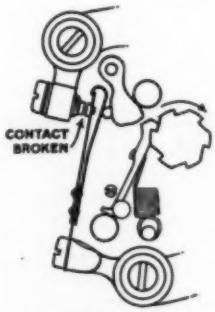


Fig. 1

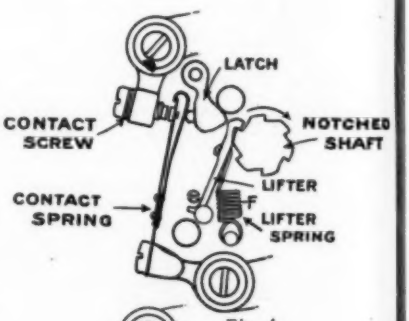


Fig. 4

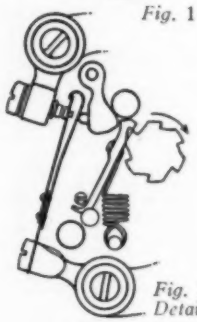


Fig. 2
Details of contact-maker

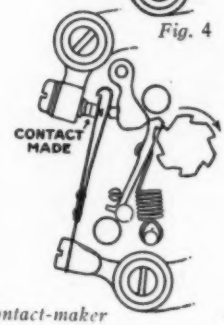


Fig. 3

Getting Full Value from Dry Batteries

An Explantaion of the Proper Methods to Be Used in Securing the Maximum Possible Amount of Service Out of Your Dry Batteries with Wiring Diagrams for Various Ignition Systems

THE dry battery is the simplest of devices for producing electric energy. From the moment it is made, a dry cell is ready to deliver current whenever and wherever needed as long as the spark of life remains in it and without requiring motion or recharging of any kind.

Each dry cell has a voltage of 1½. Most dry battery ignition systems on motor boats are designed to operate on six to nine volts, which means with four to six cells in series.

Dry cells are so inexpensive, a good many motor boat owners have just naturally assumed that they are doing the easiest and wisest thing to use 1 set of five cells till exhausted—then replace with another fresh set.

But, astonishing as it may seem, a battery of ten cells combined 5-in-series and 2-series-in-multiple will yield over 20 per cent. more ignition service than will the ten cells used 5-in-series at a time; also a battery of fifteen cells combined 5-in-series and 3-series-in-multiple will give over 30 per cent. more ignition service than will the fifteen cells used 5-in-series at a time.

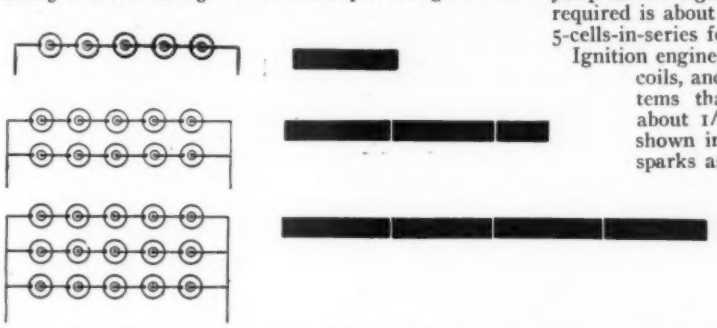


Fig. 1. Diagram which shows the relative service to be expected from dry batteries connected 5-in-series, 5-in-series—2-series-in-multiple, and 5-in-series—3-series-in-multiple

When the undeniable advantages of a series-in-multiple combination of dry cells was so clearly demonstrated it was inevitable that a manufacturer should market a battery made up in different combinations of cells—a solid, jointless, single unit for motor boats. The dry battery so made is called the Multiple Battery. It consists of a number of cells enclosed within a metal container and insulated therefrom; the cells held firmly in place by wooden blocks; all contacts permanently soldered; completely embedded in hardened insulation. The user is spared the bother of connecting the cells together and the trouble arising from loose connections, as there are none.

It is interesting to study the various methods of using the dry battery, and especially the Multiple battery, with the various ignition systems common to the motor boat.

For the make-and-break ignition shown in Fig. 2, a low-voltage current is always ample. This may be direct current from batteries; direct current from a special form of magneto; direct current from a simple type of small generator frequently seen; or alternating current from the ordinary form of low-voltage magneto. In make-and-break ignition it is the best economy to employ a battery composed of three sets of 5-cells-in-series connected in multiple. The Multiple Battery is ideal in this respect. The battery current passes into a self-induction coil, and the circuit is mechanically broken within the engine cylinder. The coil used with this system is made in a variety of shapes and sizes, its resistance varying between wide margins. It is generally conceded that the short thick coil is more satisfactory than the long slim coil, in both reliability and economy of battery current.

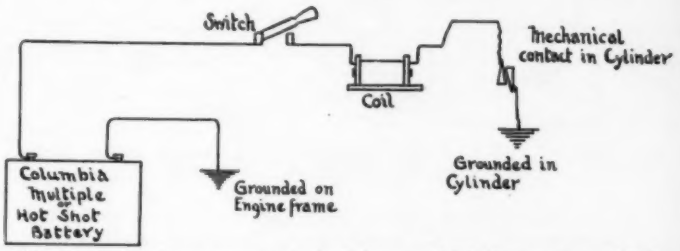


Fig. 3. Low voltage current derived from multiple battery is an ideal source of supply in make-and-break ignition systems

In the jump spark system, shown in Fig. 3, a spark is caused to pass between fixed metal points within the engine cylinder—the common spark plug. The battery current is passed into the primary of a secondary induction coil. A timer attached to the engine causes the spark to jump at the right time in the engine cycle. The current required is about ½ ampere at 6 to 9 volts (the yield of a 5-cells-in-series formation).

Ignition engineers are continually improving the design of coils, and there are now on the market ignition systems that operate with conspicuous success on about 1/10 ampere. The ordinary induction coil, shown in Fig. 3, of course continues its series of sparks as long as the primary circuit is closed.

In Fig. 4 is shown a diagram of the single spark system. The single spark system is one of the most revolutionary devices in the history of ignition, and its very simplicity makes it difficult to describe. We are so used to thinking of "buzzer" at the mere mention of "induction coil," it is hard to imagine an induction coil giving a secondary spark without a buzzer. When we think of a coil without a circuit-breaking device—without any moving or movable part whatsoever—the mind balks at picturing secondary sparks made of energy from a primary battery. Yet that is the amazingly simple method of the single spark system—thanks to the mechanical timer contact the makers have devised for creating a secondary spark, through a single instantaneous closing and opening of the primary circuit.

In addition to the current economies achieved, the manufacturers of battery ignition systems insure dependability and almost endless life of their equipment through design and workmanship of surpassing excellence.

In the dual ignition system a magneto is used in conjunction with the dry battery. In such cases the induction coil should be placed in the circuit between the magneto and the motor. Connections should be made to the wire between the large coil and the motor, the small coil being placed between this connection and the magneto; or the wire may be run directly from the magneto to the small coil, and then to any part of the motor so long as it makes a good contact. This dual system makes a very desirable form of ignition, because a reserve source of ignition current is always available.

There is also the double ignition system, which consists of two separate units—one of which is generally a high-tension magneto, and the other is a battery-operated unit. Each unit has its separate coils, timers, and distributors, in distinction from the dual system where there is but one coil available. It also has separate spark plugs. Each unit is thus entirely independent of the other.

As has been said, spark coils differ considerably; and we therefore find a wide divergence in the results of different coils when used with the same kind of battery. Following

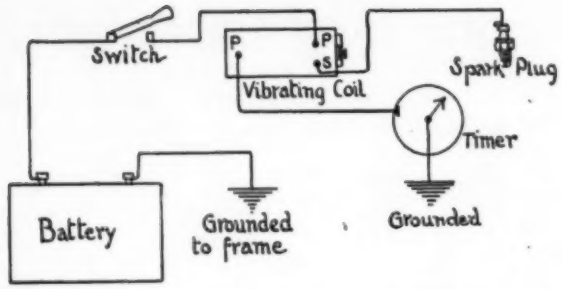


Fig. 4. The jump spark system using a multiple battery and vibrating coil is economical of current

is a table showing a test on eleven spark coils in general use, obtained from actual engine tests of coils purchased in the open market:

Coil No.	*Resistance*	*Current Consumed*	*Comparative Retail Price*
1	.619 ohms	0.5 ampere	high
2	2.732 ohms	0.2 ampere	low
3	.519 ohms	0.6 ampere	moderate
4	.617 ohms	0.5 ampere	high
5	.563 ohms	0.5 ampere	low
6	2.394 ohms	0.2 ampere	low
7	.924 ohms	0.5 ampere	low
8	.814 ohms	0.4 ampere	low
9	.718 ohms	0.3 ampere	low
10	.652 ohms	0.5 ampere	low
11	.870 ohms	0.2 ampere	moderate

Each of these coils will ignite the charge—but number 3 will take three times as much current as No. 2, 6 or 11, and hence the battery will be used up three times as fast as if No. 2, 6 or 11 were used. Moreover, the price does not indicate the coil efficiency, as is evident from the above table.

In modern marine equipment only two classes of coils are used, the vibrating and the single spark. The table below gives some idea of the relative performance of dry cells with these coils:

	Amps. Drawn	*Hours*	*Miles*
1. Multiple unit vibrator coil (poor adjustment)	1.00	15	135
2. Multiple unit vibrator coil (average adjustment)	0.50	40	360
3. Single spark system (rather poor adjustment)	0.25	95	855
4. Single spark system (average adjustment)	0.20	125	1125

The above figures represent the service when the boat is driven about two hours a day under average conditions.

With the single spark system there is little difference when this is increased to three or four hours.

Thus it is evident that with a properly adjusted coil and properly arranged battery, no cheaper or more economical or reliable ignition system has been devised. The low intial cost of the battery brings it within the reach of every purse inasmuch as a full season's run can usually be had. Another point is the simplicity of the battery as compared to other sources of electric current.

By the proper choice of battery for certain systems of lighting the dry battery will be found very acceptable for motor boat illumination.

In most cases the 6-volt tungsten lamp giving about 2 c.p.

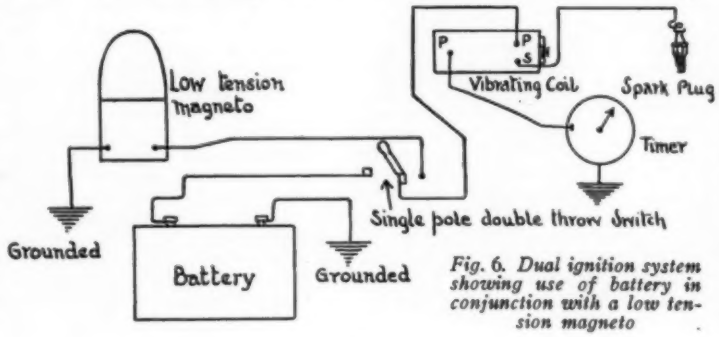


Fig. 6. Dual ignition system showing use of battery in conjunction with a low tension magneto

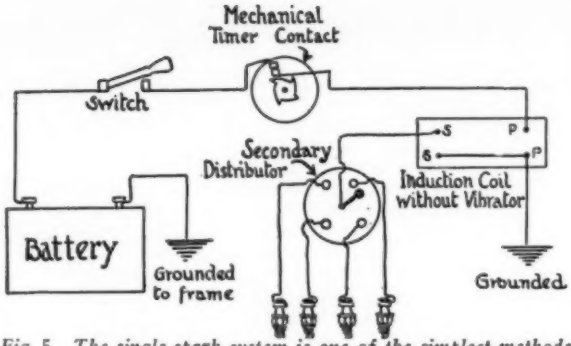


Fig. 5. The single spark system is one of the simplest methods of ignition and produces secondary sparks without a buzzer

has been found a satisfactory unit. Such a lamp will use approximately .3 of an ampere and will give more than twice as much light as the ordinary carbon filament lamp consuming the same amount of power. Also the effect of a small change in voltage is not so marked with the tungsten as with the carbon lamp. Five cells in series may be used for lighting this lamp, although it is well to resort to the multiple series for lighting, the same as is recommended for ignition.

A single snap switch may be provided to throw the running and stern lights across the battery in parallel. Considering three 6-volt 2 c.p. tungsten lamps, a multiple battery should give a minimum of 70 hours continuous burning, and more than double this amount according to the limits of its intermittent application. For instance, if the lamps were burned each night for a period of three hours, the battery would last over three months. If burned three nights a week for two hours a night, the battery would last about five months—practically a whole boating season.

The dry battery can also be employed for operating searchlights. A 6-volt tungsten lamp giving 8 c.p. may be used so that five cells in series operate is successfully. Instead of using a single battery of five cells in series we again emphasize the economy of installing the multiple battery to reduce the consumption per cell to one-third its former value.

If the searchlight is used only for docking or picking up mooring buoys, say for twenty minutes a night, a multiple battery of proper size will last for over four months or almost an entire boating season. If the light is used at night not more than three times a week, it can be burned thirty minutes a night and the battery will last about seven months. Finally, it can be burned two hours a night, two nights a week, for about four months before exhausting the battery.

Where such a searchlight is desired in connection with the regular lighting system, it is best to have a multiple battery for each and connect them in parallel. On the average it will be found that the searchlight will be used much less than the main lamps. At certain times while using the searchlight it may be necessary to burn the main lamps. Having two multiple batteries connected in parallel, the service life will be increased during those periods when either the searchlight alone or the main lamps alone are burning.

The multiple batteries may be placed under the seat, with a snap switch located conveniently near the steering wheel. By the use of a number of individual switches or multi-contact switches, either one or all of the lights may be turned on at one time.

It is common for multiple battery users to use the remaining energy for lighting purposes after their ignition life is over.

American Manufacturers of Two-Cycle Marine Motors

An Alphabetical List of Two-Cycle Marine Motors With the Names and Addresses of Their Manufacturers Giving the Range of Powers Produced by Each

Two-Cycle Marine Motor Manufacturers

American.....American Engine Co., Detroit, Mich.
2½, 4, 6, 8, 14, 20, 30 H. P. 1-4 cyls.

Acadia.....Acadia Gas Engine, Ltd., Bridgewater, N. S.
3, 4, 5, 6½, 8, 10, 13, 15, 16, 24 H. P.

Aristox.....The Black Rock Mfg. Co., Bridgeport, Conn.
12 H. P. 3 cyls. double opposed.

Barker.....Barker Factory, Norwalk, Conn.
1¼, 2½, 4, 6½, 8, 10 H. P. 1-2 cylinders.

Barber.....Barber Bros., King Bros., Successors, Syracuse, N. Y.
2½, 4, 5, 6, 8, 9, 12, 18, 24, 27, 36, 40, 60 H. P. 1-3 cyls.

Bridgeport.....Bridgeport Motor Co., Inc., Bridgeport, Conn.
4½, 6, 9, 12 H. P. 1-2 cyls.

Brown Talbot.....Brown Talbot Machinery Co., 19 Oakland St., Salem, Mass.
5, 10, 15, 20, 30 H. P. 1-3 cyls.

Bud-E.....The Carlyle Johnson Machine Co., 52 Main St., Manchester, Conn.
5 H. P. 2 cyl.

Cady of Canastota...C. N. Cady Co., Inc., Canastota, N. Y.
1¾, 3, 4, 6, 8, 12 H. P. 1-3 cyls.

Evinrude.....Evinrude Motor Co., 279 Walker St., Milwaukee, Wis.
2, 4 H. P. 1-2 cylnders.

Emerson.....Herfurth Eng. & Mach. Co., Alexandria, Va.
10, 20, 40, 60 H. P. 1-6 cyls.

Frazer Adams.....Frazer Bros. Co., Adams, N. Y.
2, 4, 5, 10 H. P. 1-2 cyls.

Guarantee.....Guarantee Motor Co., 369 Bay St., North, Hamilton, Ont.
3, 5, 6, 7, 9, 10, 11, 14, 18, 22 H. P. 1-2 cyls.

Gile.....Gile Marine Engine Co., 160 Middlesex Ave., Somerville, Mass.
20 H. P. 3 cyls.

Greenport.....J. S. Gaffga & Co., Greenport, N. Y.
3, 4, 5, 6, 8, 10, 12, 15 H. P. 1-2 cyls.

Gilmore.....Gilmore Marine Motor Corp., 404 24th St., Detroit, Mich.
2, 4, 7, 10 H. P. 1-4 cyls.

Gray.....Gray Motor Co., 2108 Mack Ave., Detroit, Mich.
3, 5½, 6 H. P. 1-2 cyls.

H. L. B......H. L. Brownback Co., Norristown, Pa.
3 H. P. 1 cyl.

Hartford.....Gray-Prior Machine Co., 56 Suffield St., Hartford, Conn.
5, 8, 10, 20 H. P. 1-2 cyls.

Imperial.....Bruce Stewart & Co., Ltd., Charlottestown, P. E. I.
4, 5, 10, 15, 30 H. P. 1-3 cyls.

Kahlenberg.....Kahlenberg Bros. Co., Two Rivers, Wis.
3, 4, 6, 8, 12, 15, 16, 24, 30, 36, 45, 54, 55, 85 H. P. 1-3 cyls.

Knox.....Camden Anchor Rockland Machine Co., Camden, Me.
3, 4½, 5½, 6, 7½, 9, 11, 15 H. P. 1-2 cyls.

Lathrop.....J. W. Lathrop Co., Mystic, Conn.
3, 4, 5, 6, 7, 8, 10, 12, 14, 16, 20, 24, 36 H. P. 1-3 cyls.

L-A.....Lockwood Ash Motor Co., Jackson, Mich.
2½, 4, 6, 8 H. P. 1-2 cyls.

L. & D......L. & D. Motor Wks., 75 Prospect Ave, Hartford, Conn.
3 H. P. 1 cyl.

Motorgo.....Sears, Roebuck & Co., 925 Homan Ave., Chicago, Ill.
2¼, 4, 6, 8 H. P. 1-2 cyls.

Mianus.....Mianus Motor Wks., Stamford, Conn.
3, 5, 6, 7½, 10, 12, 15, 20 H. P. 1-2 cyls.

Mohawk.....S. R. Mfg. Co., Schenectady, N. Y.
3½, 5, 6, 7, 10, 12, 16, 18, 21, 25, 30 H. P. 1-4 cyls.

Ontario.....A. E. Olmstead & Sons, Pulaski, N. Y.
2, 3, 6, 7, 9, 12, 14, 21, 28 H. P. 1-4 cyls.

Palmer.....Palmer Bros. Engines, Inc., Cos Cob, Conn.
2, 2½, 4, 5, 6, 7½, 10, 12 H. P. 1-2 cyls.

Perfection.....Caille Perfection Motor Co., Detroit, Mich.
2½, 4, 6, 8, 14, 20, 30 H. P. 1-4 cyls.

Rex.....Neponset Engine & Machine Co., Neponset Sta., Boston, Mass.
1½, 3, 6, 8, 12, 16, 18, 24 H. P. 1-3 cyls.

Roberts.....Roberts Motors Co., Sandusky, O.
4, 16 H. P. 1-4 cyls.

Superior.....Superior Motor Wks., Jackson, Mich.
6, 12 H. P. 1-2 cyls.

Toledo.....Universal Machine Co., Bowling Green, O.
3, 6, 7, 12 H. P. 1-2 cyls.

Waterman.....Arrow Motor & Mach. Co., 397 Market St, Newark, N.J.
2½, 3, 6 H. P. 1-2 cyls.

Two-Cycle Outboard Motor Manufactures

Aerothrust.....Aerothrust Engine Co., La Porte, Ind.
3, 5 H. P. 2 cyls.

Evinrude.....Evinrude Motor Co., 279 Walker St., Milwaukee, Wis.
2, 3½ H. P. 1 cyl.

Gilmore.....Gilmore Marine Motor Corp., 404 24th St., Detroit, Mich.
2 H. P. 1 cyl.

Koban.....Koban Mfg. Co., 241 South Water St., Milwaukee, Wis.
3 H. P. 2 cyl.

Motorgo.....Sears, Roebuck & Co., 925 Homan Ave., Chicago, Ill.
2 H. P. 1 cyl.

Wisconsin Detachable..Wisconsin Machinery & Mfg. Co., Milwaukee, Wis.
2, 3½ H. P. 1 cyl.

Two-Cycle Heavy Oil Motor Manufactures

Bolinders.....Bolinders Co., 30 Church St., New York, N. Y.
5, 500 H. P. 1-4 cylinders.

Busch-Sulzer.....Busch-Sulzer Bros., Diesel Engine Co., 2nd and Utah Sts., Xt. Louis, Mo.
650, 1150, 1850 H. P. 4 cyls.

Fairbanks-Morse C. O...Fairbanks-Morse Co., 900 So. Wabash Ave., Chicago Ill.
30, 45, 60, 75, 100, 150, 200, 300 H. P. 2-6 cyls.

G. G......Gulowsen Grei Engine Co., Seattle, Wash.
30, 45, 60, 80, 90, 125, 180, 240, 360, 550 H. P. 2-6 cyls.

Jacobson.....The Jacobson Gas Engine Co., Albany, N. Y.
3, 4, 7, 8, 10, 13, 14, 16, 20, 25, 26, 30, 33, 35, 40, 50, 52 60, 65, 70, 75, 80, 90, 100, 105, 120, 140, 160 H. P.

Kahlenberg.....Kahlenberg Bros. Co., Two Rivers, Wis.
70, 100, 130 H. P. 2-4 cyls.

Mianus.....The Mianus Motor Works, Stamford, Conn.
30, 45, 60 H. P. 2-4-6 cyls.

Mietz.....Aug. Mietz Corp., 430 East 19th St., New York, N.Y.
15, 60 H. P. 2-3 cyls. 75, 350 H. P. 3-4 cyls.

Missouri.....Missouri Engine Co., 2806 N. 11th St., St. Louis, Mo.
7, 14, 22, 30 H. P. 1-4 cyls.

Remington.....Remington Oil Engine Co., Stamford, Conn.
4, 7, 10, 11, 14, 17, 22, 23, 24, 32, 34, 35, 37, 46, 55, 75 H. P. 1-4 cyls.

Skandia.....Skandia Pacific Oil Engine Co., Oakland, Cal.
9, 16, 24, 38, 55, 70, 100, 120, 140, 200, 240, 360, 500 H.P. 1-6 cyls.

Venn Severin.....Venn Severin Machine Co., 1317 W. North Ave., Chicago Ill.
10, 20, 25, 40, 45, 70, 100, 150, 200 H. P. 1-4 cyls.

Weiss.....Weiss Engine Co., 17 Battery Place, New York, N. Y.
45, 60, 75, 120, 150, 200, 225, 300, 400 H. P. 3-4 cyls.

Fiat San Giorgio.....Ansaldo San Giorgio, 80 Maiden Lane, New York, N. Y.
175 to 1200 H. P.

Steam Plant Manufactures

Talbot.....Talbot Engineering Corp., 66 Broadway, New York, N.Y.
50, 100, 200, 400, 600, 1500, 2000 H. P. 4 cyls.

Two-Cycle Marine Motors for 1920

The initials used in the column headed Ignition indicate the standard equipment supplied, and have the following meanings: B—Battery Ignition; B. & M.—System using both battery and coil with magneto; M. & B.—Make and break system with either batteries or low tension magneto; J. S.—Jump spark battery and coil system; M.—High tension magneto: Opt.—Purchaser has the option of make and break or jump spark systems. Weights shown with an asterisk (*) do not include reverse gear.

Two-Cycle Motors under 4 Horsepower

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
1¼	Barker	1	3⅛x3½	525	110	2	M. & B.
1½	Rex	1	2½x2½	700	55	2	J. S.
1½	Cady of Canastota	1	3 x2½	700	...	3	B.
2	Evinrude	1	2½x2½	700	45	2	M.
2	Gilmore	1	3 x2½	800	38	3	J. S.
2	Frazer Adams	1	3⅛x3	900	...	..	J. S.
2	Ontario	1	2⅝x2⅝	600	80	3	Opt.
2	Palmer	1	3¾x3½	500	135*	3	M. & B.
2½	American	1	3¼x3½	750	75	2	J. S.
2½	Barber	1	3¼x3¼	750	75	3	J. S.
2½	Barker	1	4⅛x4¼	450	170	2	M. & B.
2½	L-A	1	3¼x3½	750	...	2	J. S.
2½	Motorgo	1	3¼x3¼	750	97*	2	B.
2½	Palmer	1	3¾x3½	700	125	3	J. S.
2½	Perfection	1	3¼x3½	700	140	2	J. S.
2½	Waterman	1	2¾x3	800	36	3	M.
3	Acadia	1	4 x3½	550	...	..	M. & B.
3	Cady of Canastota	1	3⅝x3¾	700	130	3	B.
3	Gray	1	3½x3½	1,300	89	3	J. S.
3	Greenport	1	4 x4	550	281	2	M. & B.
3	Guarantee	1	3¾x3½	...	...	..	J. S.
3	H. L. B.	1	3¼x3	800	80	2	J. S.
3	Kahlenberg	1	3½x3½	600	125	2	M. & B.
3	Knox	1	4 x4	600	205	..	Opt.
3	Lathrop	1	4 x4	500	...	..	Opt.
3	L. & D.	1	3½x4	900	98	2	J. S.
3	Mianus	1	4 x4	550	195	2	M. & B.
3	Ontario	1	3½x3½	900	125	3	Opt.
3	Rex	2	2½x2½	700	85	2	J. S.
3	Snapper	1	4¼x4	...	205	..	M. & B.
3	Toledo	1	3½x3½	750	140	2	J. S.
3	Waterman	1	2¾x3	1,000	68	3	Opt.
3½	Mohawk	1	3½x3¾	900	145	..	Opt.
4	Acadia	1	4 x4	600	...	..	M. & B.
4	American	1	3⅞x3½	800	150	3	J. S.
4	Barber	1	4 x4	600	150	3	J. S.
4	Barker	1	4⅛x5	475	220	2	M. & B.
4	Cady of Canastota	1	4½x4	700	175	3	B.
4	Evinrude	2	2½x2½	1,150	68	2	M.
4	Frazer Adams	2	3⅛x3	900	...	..	J. S.
4	Gilmore	2	3 x2¼	800	68	3	J. S.
4	Greenport	1	4½x5	500	381	2	M. & B.
4	Imperial	1	4 x3½	500	220	3	J. S.
4	Kahlenberg	1	4 x4	550	160	2	M. & B.
4	Lathrop	1	4½x5	500	...	2	Opt.
4	L-A	1	4 x4	750	...	2	J. S.
4	Motorgo	1	4 x4	750	135*	2	B.
4	Palmer	1	4½x4½	450	240*	2	M. & B.
4	Palmer	1	4½x4½	650	210*	3	J. S.
4	Perfection	1	3⅞x3½	800	150	2	J. S.
4	Roberts	1	3½x4	1,000	122	..	Opt.

Two-Cycle Marine Motors for 1920—(Continued)

4½ to 7 Horsepower Two-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
4½	Bridgeport	1	4½x5	500	275	Opt.	Opt.
4½	Knox	1	4¾x4½	550	250	Opt.	Opt.
5	Acadia	1	4 x4	800	...	..	J. S.
5	Acadia	1	4½x5	550	...	..	M. & B.
5	Barber	2	3¼x3¼	750	150	3	J. S.
5	Brown Talbot	1	4 x4	750	200	2	J. S.
5	Bud E	2	3 x3	1,200	110	3	M.
5	Frazer Adams	1	3¾x4¼	900	...	..	J. S.
5	Greenport	1	5 x5½	475	450	2	M. & B.
5	Guarantee	1	4½x4½	...	...	..	J. S.
5	Hartford	1	4 x4½	700	230	2	M. & B.
5	Imperial	1	4½x4	500	280	3	J. S.
5	Lathrop	1	5 x5	500	...	2	Opt.
5	Mianus	1	4½x5	500	340	2	M. & B.
5	Mohawk	1	4½x4½	500	310	Opt.	Opt.
5	Palmer	2	3¾x3½	700	180*	3	J. S.
5	Snapper	1	5¼x5	...	340	2	M. & B.
5½	Gray	1	4¼x4¼	1,100	170	3	J. S.
5½	Knox	1	5 x5¼	550	330	Opt.	Opt.
6	American	1	4¾x4½	800	200	2	J. S.
6	Barber	1	4¼x4¾	600	245	3	J. S.
6	Bridgeport	1	5¼x5¼	500	310	Opt.	Opt.
6	Cady of Canastota	2	3½x3¾	700	180	3	B.
6	Foreman	2	3½x3½	800	220	3	B.
6	Gray	2	3½x3½	1,100	138	3	J. S.
6	Greenport	1	5½x6	450	529	2	M. & B.
6	Greenport	2	4 x4	550	431	2	M. & B.
6	Guarantee	2	3¾x3½	...	...	..	J. S.
6	Kahlenberg	1	5 x5	400	400	2	M. & B.
6	Knox	2	4 x4	600	370	Opt.	Opt.
6	L-A	2	3½x3½	800	...	2	J. S.
6	Lathrop	1	5½x5	500	...	2	Opt.
6	Lathrop	1	5¼x6½	400	...	2	Opt.
6	Mianus	1	4¾x5	700	335	2	J. S.
6	Mianus	2	4 x4	550	355	2	M. & B.
6	Mohawk	1	4⅛x3¾	1,200	155	Opt.	Opt.
6	Mohawk	1	4½x4½	700	275	Opt.	Opt.
6	Motorgo	2	3½x3½	750	154*	2	B.
6	Ontario	2	3½x3½	900	190	3	Opt.
6	Palmer	1	5 x6	625	325*	3	J. S.
6	Palmer	1	5 x6	400	350*	2	M. & B.
6	Perfection	1	4¾x4½	800	200	2	J. S.
6	Rex	1	4½x5	600	310	2	J. S.
6	Superior	1	4½x4	800	293	2	J. S.
6	Toledo	1	4½x4½	750	200	2	Opt.
6	Waterman	1	4 x4	600	111	3	B.
6	Waterman	2	2¾x3	800	60	3	M.
6½	Acadia	1	5½x5	600	...	..	M. & B.
6½	Barker	1	5½x6½	400	350	2	M. & B.
7	Gilmore	3	3 x2½	800	92	3	J. S.
7	Guarantee	1	5 x5	...	...	..	J. S.
7	Lathrop	1	6 x6½	375	...	2	Opt.
7	Mohawk	1	4½x4½	900	275	Opt.	Opt.
7	Mohawk	2	3½x3¾	900	215	Opt.	Opt.
7	Ontario	1	5 x5	450	300	3	Opt.
7	Toledo	2	3½x3½	750	200	2	Opt.

7½ to 11 Horsepower Two-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
7½	Mianus	1	5⅛x6	450	490	2	M. & B.
7½	Knox	1	5½x6¼	550	500	Opt.	Opt.
7½	Palmer	1	6 x6	400	375	2	M. & B.
8	Acadia	1	5½x6	550	...	..	M. & B.
8	Acadia	2	4 x4	600	...	..	M. & B.
8	American	1	5¼x5	550	335	2	J. S.
8	American	2	3⅞x3½	800	280	2	J. S.
8	Barber	2	4 x4	600	270	3	J. S.
8	Barber	3	3¼x3¼	750	190	3	J. S.
8	Barker	2	4⅛x5	475	380	2	M. & B.
8	Cady of Canastota	2	4½x4	700	245	3	B.
8	Greenport	1	6 x6½	400	579	2	M. & B.
8	Greenport	2	4⅝x5	500	525	2	M. & B.
8	Hartford	1	4½x4½	700	240	2	M. & B.
8	Kahlenberg	1	5½x6	400	550	2	M. & B.
8	Kahlenberg	2	4 x4	550	350	2	M. & B.
8	Lathrop	1	6½x6½	375	...	2	Opt.
8	L-A	2	4 x4	800	...	2	J. S.
8	Motorgo	2	4 x4	750	222*	2	B.
8	Perfection	1	5¼x5	550	335	2	M. & B.
8	Perfection	2	3⅞x3½	800	280	2	J. S.
9	Barber	1	5½x5¼	550	270	3	J. S.
9	Bridgeport	2	4½x5	500	425	Opt.	Opt.
9	Knox	2	4¼x4½	600	380	Opt.	Opt.
9	Guarantee	1	5½x5	...	...	..	J. S.
9	Ontario	3	3½x3½	900	270	3	Opt.
10	Acadia	2	4½x5	550	...	..	M. & B.
10	Acadia	2	4 x4	800	...	..	J. S.
10	Barker	2	6½x8	350	510	2	M. & B.
10	Brown Talbot	1	5½x5	500	350	2	J. S.
10	Brown Talbot	2	4 x4	750	300	2	J. S.
10	Emerson	1	5 x5	1,150	240	3	J. S.
10	Frazer Adams	2	3¾x4¼	900	...	..	J. S.
10	Gilmore	4	3 x2½	800	127	3	J. S.
10	Greenport	2	5 x5½	475	625	2	M. & B
10	Guarantee	2	4½x4½	...	...	..	J. S.
10	Hartford	1	5 x5¼	700	310	2	M. & B.
10	Imperial	1	5½x6	500	420	3	J. S.
10	Imperial	2	4½x4	500	825	3	J. S.
10	Lathrop	1	7 x7½	300	...	2	Opt.
10	Mianus	1	6½x7	375	815	2	M. & B.
10	Mianus	2	4⅝x5	500	580	2	M. & B.
10	Mohawk	2	4½x4½	500	510	Opt.	Opt.
10	Palmer	2	4½x4½	650	325*	3	J. S.
11	Guarantee	1	6 x5	...	...	..	J. S.
11	Knox	2	5 x5¼	550	480	Opt.	Opt.

12 to 20 Horsepower Two-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
12	Aristox (twin opp.)	3	3⅛x3½	600	500	3	B. & M.
12	Barber	1	6½x6¼	500	400	3	J.
12	Barber	2	4¾x4¾	600	375	3	J. S
12	Barber	3	4 x4	600	390	3	J. S
12	Bridgeport	2	5¼x5¼	500	520	Opt.	Opt.
12	Cady of Canastota	3	4½x4	700	485	3	B.
12	Foreman	2	4¼x4¼	800	375	3	B.
12	Greenport	2	5½x6	450	804	2	M. & B.
12	Kahlenberg	1	6½x7	350	750	2	M. & B.
12	Kahlenberg	2	5 x5	400	650	2	M. & B.
12	Lathrop	1	7½x7½	275	...	2	Opt.
12	Lathrop	2	5½x5	500	...	2	Opt.
12	Lathrop	2	5¼x6½	400	...	2	Opt.
12	Mianus	2	4½x5	700	570	2	J. S.
12	Mohawk	2	4⅛x3¾	1,200	220	Opt.	Opt.
12	Mohawk	2	4½x4½	700	400	Opt.	Opt.
12	Ontario	4	3½x3½	900	350	3	Opt.
12	Superior	2	4½x4	800	393	2	J. S.
12	Toledo	2	4½x4½	750	350	2	Opt.
13	Acadia	2	5½x5	600	...	..	M. & B.
14	American	2	4¾x4½	800	350	2	J. S.
14	Guarantee	1	7 x7	...	...	..	J. S.
14	Guarantee	2	5 x5	...	...	..	J. S.
14	Lathrop	2	6 x6½	400	...	2	Opt.
14	Ontario	2	5 x5	600	500	3	Opt.
14	Perfection	2	4¾x4½	800	350	2	J. S.
15	Acadia	3	4 x4	700	...	..	J. S.
15	Brown Talbot	1	7 x6¼	350	600	2	J. S.
15	Brown Talbot	3	4 x4	750	350	3	J. S.
15	Greenport	2	6 x6½	400	1,025	2	M. & B.
15	Imperial	3	4½x4	500	500	3	J. S.
15	Kahlenberg	1	7 x8	325	900	2	M. & B.
15	Knox	2	5½x6¼	500	760	Opt.	Opt.
15	Mianus	2	5⅛x6	450	875	2	M. & B.
16	Acadia	2	5½x6	550	...	..	M. & B.
16	Kahlenberg	2	5½x6	375	950	2	M. & B.
16	Lathrop	2	6½x6½	400	...	2	Opt.
16	Mohawk	2	4½x4½	900	395	Opt.	Opt.
16	Roberts	4	3½x4	1,000	265	..	Opt.
18	Barber	2	5½x5¼	550	535	3	J. S.
18	Barber	3	4¾x4¾	600	500	3	J. S.
18	Guarantee	2	5½x5	...	...	..	J. S.
18	Mohawk	3	4½x4½	700	510	Opt.	Opt.
20	American	2	5¼x5	600	495	2	J. S.
20	Brown Talbot	2	5½x5	500	600	2	J. S.
20	Emerson	2	5 x5	1,150	325	3	J. S.
20	Gile	3	4 x5	500	1,100	H	M.
20	Hartford	2	5 x5¼	700	440	2	M. & B.
20	Imperial	2	5½x6	500	825	3	J. S.
20	Lathrop	2	7 x7½	300	...	2	Opt.
20	Mianus	2	6½x7	375	1,390	2	M. & B.
20	Perfection	2	5¼x5	600	495	2	J. S.

Two-Cycle Motors over 20 Horsepower

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
21	Mohawk	3	4¼x3¾	1,200	290	Opt.	Opt.
21	Ontario	3	5 x5	600	700	3	Opt.
22	Guarantee	2	6 x5	...	...	..	J. S.
24	Acadia	3	5½x6	550	1,150	..	J. S.
24	Barber	2	6½x6¼	500	695	3	J. S.
24	Kahlenberg	2	6½x8	350	1,300	2	M. & B.
24	Lathrop	2	7½x7½	275	...	2	Opt.
25	Mohawk	4	4½x4½	700	775	Opt.	Opt.
27	Barber	3	5½x5¼	550	675	3	J. S.
28	Ontario	4	5 x5	600	900	3	Opt.
30	American	4	4¾x4½	850	595	2	M.
30	Brown Talbot	2	7 x6¼	350	1,000	2	J. S.
30	Imperial	3	5½x6	500	1,100	3	J. S.
30	Kahlenberg	2	7 x8	325	1,800	2	M. & B.
30	Mohawk	3	4½x4½	1,200	495	Opt.	Opt.
30	Perfection	4	4¾x4½	1,000	600	2	M.
36	Barber	3	6½x6¼	500	925	3	J. S.
36	Kahlenberg	3	6½x7	325	1,700	2	..
36	Lathrop	3	7½x7½	275	...	2	J. S.
40	Barber	2	8x 8	350	1,950	3	J. S.
40	Emerson	4	5 x5	1,150	550	3	J. S.
45	Kahlenberg	3	7 x8	325	2,600	2	..
54	Kahlenberg	3	7¾x8	325	2,800	2	..
60	Barber	3	8 x8	350	2,850	3	J. S.
60	Emerson	6	5 x5	1,150	850	3	J .S.
85	Kahlenberg	3	9 x10	300	5,000	2	..

Detachable Outboard Motors

Rated H. P.	2 or 4 Cycle	Motor	No. of Cyls.	Bore and Stroke	R.P.M.	Wt.	Ports or Valves	Ignition
2	2	Evinrude	1	2⅝x2½	700	73	2	M.
2	2	Gilmore	1	2¾x2½	900	59	3	J. S.
2	4	Joymotor	1	2⅝x2½	1,025	50	..	M.
2	2	Lockwood-Ash	1	2⅝x2½	800	70	3	M.
2	2	Motorgo	1	2⅝x2½	850	70	2	M.
2	2	Wis. Detachable	1	2⅝x2½	650	58	2	B. or M.
3	2	Aerothrust	1	2½x2¼	1,600	85	2	J. S.
3	4	Airdrive	2	2⅝x3	1,800	67	L	M.
3	2	Koban	2	2⅝x2⅜	900	80	2	M.
3½	2	Evinrude	1	3⅛x3	550	116	2	M.
3½	2	Wis. Detachable	1	3¼x3¼	650	100	2	M.
4	4	Evinrude	2	2¾x2½	750	99	L	M.
5	2	Aerothrust	2	3 x3½	1,300	125	2	J. S.
10	4	Airdrive	2	4 x4	1,400	122	H	M.

Choosing a Power Plant to Fit Your Boat

Some of the Conditions Which Must Be Studied Before a Satisfactory Conclusion Can Be Reached—More Than Catalogs Needed

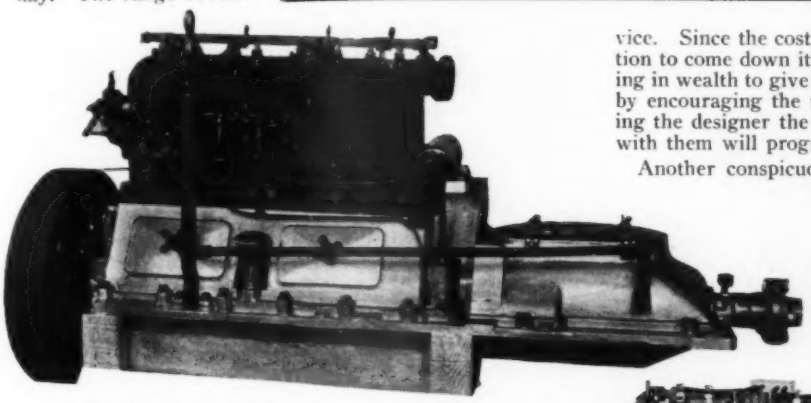
By F. W. Horenburger

An immense amount of data concerning all reputable and reliable makes of American Marine Motors is tabulated in this issue of MoToR BoatinG. Sufficient data is given to permit one familiar with motor boat practice to select the most suitable power plant for his particular conditions. On the following pages will be found complete lists of all engine manufacturers and their addresses, together with the range of horsepower sizes which they produce. Manufacturers of two-cycle, four-cycle, and heavy-oil engines are all listed separately. A purchaser partial to any particular make of engine can determine from these tables all the various sizes of engines built by the particular manufacturer in mind.

On pages 35 to 42 will be found a complete list of all engines built, tabulated in the order of their horsepowers. Should one desire a motor of 16 h.p. he can locate all the motors of that particular size at once. A choice among these is then comparatively simple.

Full particulars as to bore, stroke, number of cylinders, revolutions, etc., are all given in these tables. While the use of the tables alone will not enable one to make a final selection, they should be immensely valuable in narrowing down the choice. The judgment of the buyer which is an important item, must also be exercised. The manufacturer should be consulted in every case, as his advice is always of value.—Editor.

THE eternal question as to which motor is the proper one is again before us. Those of us who are building new boats or are considering the installation of a new power plant will have to solve this question anew. For the benefit of these we are giving here complete statistics of every reputable and reliable marine engine manufacturer today. The range of sizes



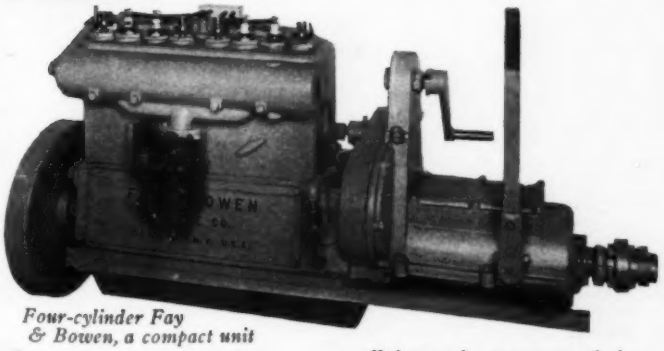
A popular size four-cylinder Buffalo

is sufficient to meet every possible requirement. From a little motor of 1½ h. p. weighing only 38 pounds to a monster of 2,000 h.p. weighing about 735,000 pounds, the list includes every possible combination between the extremes. The individual who cannot find a type after his particular ideas among them will be indeed hard to please.

Among the most conspicuous features of the 1920 lines of many manufacturers is the ever-increasing tendency toward the heavy-oil engines. Both two-and four-cycle engines are listed from 4 h.p. up designed primarily for operation on the heavy cheaper oils rather than expensive gasoline. For any installation except the light-weight high-speed types these are eminently suitable. In addition to these distinctly heavy-oil machines practically all manufacturers, are in a position to supply, either as stock equipment or as an extra, some form or other of kerosene consuming device. Since the cost of gasoline does not show any inclination to come down it behooves those of us who are not rolling in wealth to give serious thought to these devices. Only by encouraging the manufacture of these devices and giving the designer the benefit of the various experiences had with them will progress be made.

Another conspicuous feature is the tendency to discontinue the manufacture of two-cycle gasoline engines. On account of their greater fuel consumption and lesser efficiency they are being supplanted by the more efficient four-cycle types notwithstanding the greater complexity of the latter.

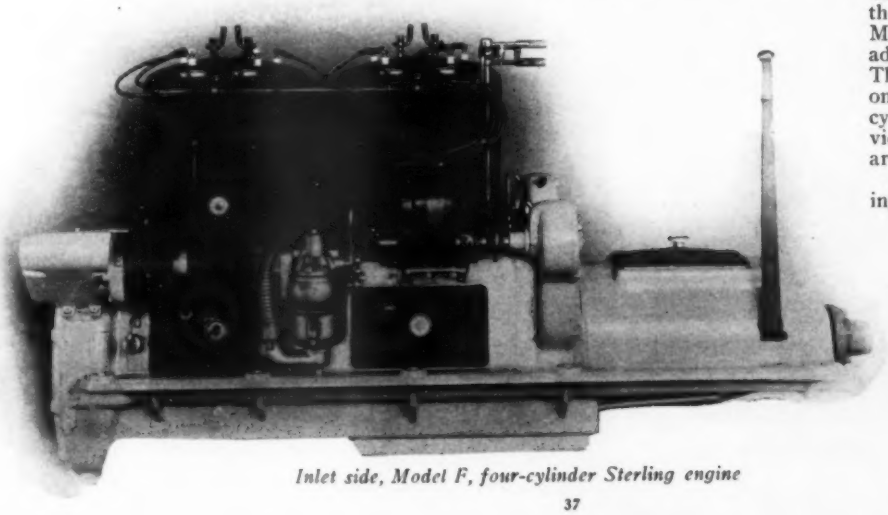
The tendency towards greater



Four-cylinder Fay & Bowen, a compact unit

efficiency is pronounced in the four-cycle types also. Many manufacturers are adopting overhead valves. These afford easier gas flow on both intake and exhaust cycles. Numerous new devices for using cheaper fuel are seen.

Again on account of starting troubles with poor gasolines we see a more general equipping of motors with electric- and air-starting devices. Magneto manufacturers have felt the call for improvement also. The new magnetos are equipped with what is called an impulse starter. The function of this is to project a flame into the



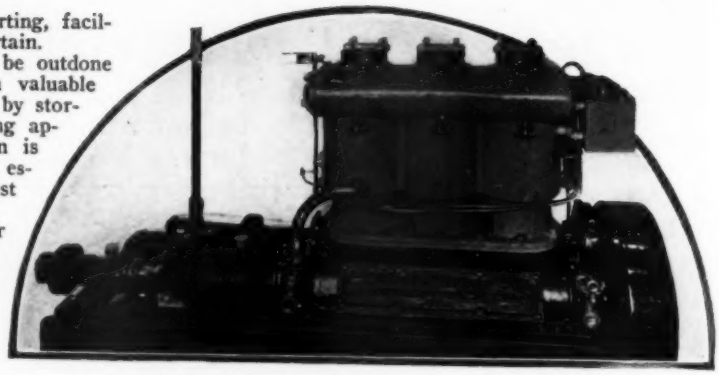
Inlet side, Model F, four-cylinder Sterling engine

combustion chamber at slow speeds when starting, facilitating this operation and rendering it more certain.

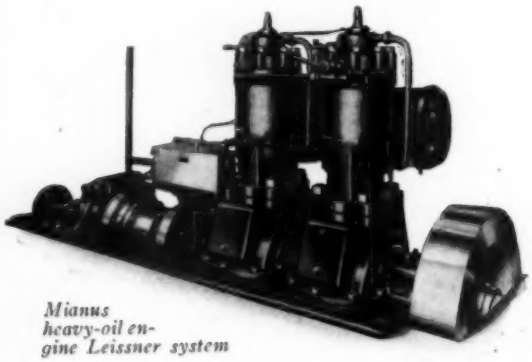
The storage battery manufacturers not to be outdone have likewise improved their product. Much valuable knowledge was gained during the war period by storage battery manufacturers which is now being applied to good account. Whether the ignition is derived from battery or magneto a hot spark is essential. Which of these furnishes the hottest spark we would not venture to say.

Lubrication difficulties have been looked after also. A more general use of force-feed and mechanical-oiling systems and devices is noticed. The old splash system is being supplemented or even entirely superseded by its more modern competitors.

The selection of a type to suit individual requirements is where the difficulty begins. We have the large sail boat with auxiliary motor power, the modern cruiser, the express cruiser, and the light runabout all requiring various amounts of horsepower. The difference in type suitable for each of these is tremendous. Differences in hull design, freedom of flow of water to the propeller, deadwood further obstructing the flow of water, and numerous other factors all combine to make the problem difficult.



Medium-duty Frisbie of durable construction



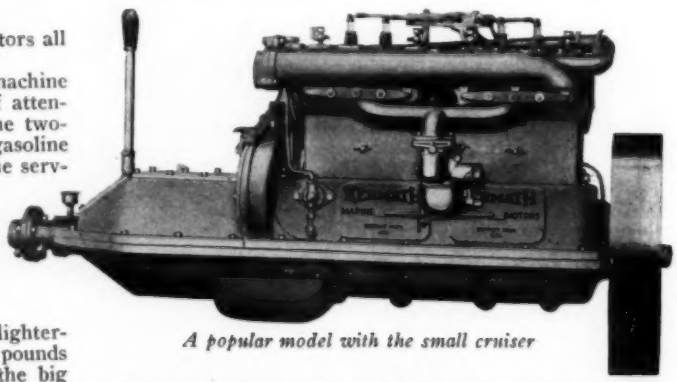
Mianus heavy-oil engine Leissner system

We want for the auxiliary sail boat a heavy-duty machine of slow-speed which will run with the minimum of attention day after day. Naturally we select one of the two-cylinder type heavy models. Whether we adopt gasoline or an oil engine depends further on the nature of the service. An engine which makes only short runs with frequent starts and stops might do better with gasoline, on the other hand a heavy-oil engine would be most suitable for runs of one to several days' duration, here the better fuel economy of the heavy-oil engine would be a deciding factor.

Again the cruiser would require a medium-speed lighter-weight machine, say something about 1,500 to 2,500 pounds and 600 to 800 r.p.m. for the small boat and for the big fellow there are many machines to choose from. Express cruisers and runabouts of high-speed are limited by weight. They will naturally wish to extract the greatest amount of power out of the smallest possible number of pounds. Combine this with a sufficient amount of reliability and endurance and we have our modern high-speed engines. Many of these have been developed for this particular type of service.

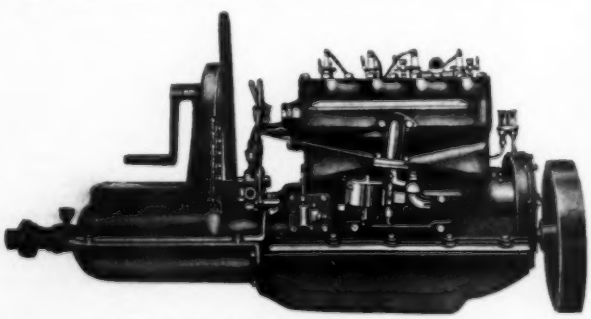
Up to this point we have not considered what will be to many the deciding factor. What does it cost? As is the fashion today, the prices of marine engines have advanced in common with everything else. Although the prices are uniformly higher than in the past, many manufacturers state that the margin of profit is less today than formerly.

The range of prices is about as extensive as the range of sizes. Some multi-cylinder machines sell for as low a price as $20 per horsepower. More expensive specimens will average $30 per horsepower, and the most costly machines will sell for from $60 to $70 per horsepower. Surely any prospective purchaser can be suited by the price range given. As a rule single-cylinder, low-powered machines cost relatively more per horsepower than the high-powered, multi-cylinder machines. It will, therefore, follow that a purchaser may, for a certain fixed sum be able to get more power per dollar expended by making a study of prices along the lines indicated.



A popular model with the small cruiser

For the service required of harbor tugs, work boats, fishing boats and coastwise sailing vessels with auxiliary power, even including large freight vessels of 3,500 tons and upwards, no power plant installation can be better adapted than the heavy-oil engine. The relatively small amount of space occupied as compared to the average steam installation is in itself a valuable feature. Fuel oil can be stowed safely in tanks located in spaces which would otherwise not be used. Coal bunker space would accordingly be released for cargo or other useful purposes. These engines are as reliable and dependable as steam. Vessels are making long voyages continuously with few reports of motor trouble. Records reported covering a year's operation of a certain vessel of about 9,000 tons equipped with twin-screw engines of 2,000 h.p. each show an operating cost of $144 per day. She covered in this time 320 miles and used 2,880 gallons of crude oil. A coal burning vessel of similar size and speed used 65 tons of coal costing $560 per day. The difference in daily costs is marked and the superior economy of the oil engine plainly apparent.



12 *h.p. Universal a self-contained plant*

Heavy Oil Marine Motors for 1920

The ignition systems used on these heavy oil engines are very different from those common to the gasoline engines. The abbreviations used in the tables have the following meanings: Hot Bulb, the ignition employed on engines generally using so-called low compression pressures and requiring a heated ball or surface of some kind to ignite the charge; Semi-Diesel, this type also uses a heated surface for ignition, but uses different methods of fuel injection; Diesel, ignition on these is entirely due to the heat of compression of the air in the cylinders, high pressure being necessary. H, under location of valves, refers to their location in the head.

Four-Cycle Heavy-Oil Engines

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	2 or 3 Port	Ignition
4	Jacobson	1	4¼x5	600	400	3	Hot Bulb
4	Remington	1	3⅞x5	700	550	3	Hot Bulb
7	Jacobson	1	5½x6	550	600	3	Hot Bulb
7	Missouri	1	5 x6	500	675	3	Hot Bulb
7	Remington	1	5½x6	500	800	3	Hot Bulb
8	Jacobson	2	4¼x5	600	800	3	Hot Bulb
9	Skandia	1	.....	500	1,325	.	Semi-Deisel
10	Jacobson	1	6½x7	500	1,200	3	Hot Bulb
10	Remington	1	6¾x6	500	825	3	Hot Bulb
10	Venn Severin	1	6 x8	425	950	2	Hot Bulb
11	Remington	1	7 x8	400	1,500	3	Hot Bulb
12	Jacobson	3	4¼x5	600	1,200	3	Hot Bulb
13	Jacobson	1	7¼x8¼	450	1,800	3	Hot Bulb
14	Remington	2	5½x6	500	1,050	3	Hot Bulb
14	Jacobson	2	5½x6	550	1,200	3	Hot Bulb
14	Missouri	2	5x6	500	1,100	3	Hot Bulb
15	Mietz	1	.....	...	...	..	Hot Bulb
16	Jacobson	1	8 x8¼	450	1,925	3	Hot Bulb
16	Skandia	1	.....	400	2,750	..	Semi-Diesel
17	Remington	1	8¼x8	400	1,600	3	Hot Bulb
20	Jacobson	1	8½x9½	410	2,700	3	Hot Bulb
20	Jacobson	2	6½x7	500	1,900	3	Hot Bulb
20	Venn Severin	1	8 x10	325	1,875	2	Hot Bulb
21	Jacobson	3	5½x6	550	1,800	3	Hot Bulb
22	Missouri	3	5 x6	500	2,100	3	Hot Bulb
22	Remington	2	6¾x6	500	1,100	3	Hot Bulb
23	Remington	3	5½x6	500	1,600	3	Hot Bulb
24	Remington	2	7 x8	400	2,100	3	Hot Bulb
24	Skandia	1	.....	375	3,750	..	Semi-Diesel
25	Jacobson	1	9½x9½	410	2,700	2	Hot Bulb
25	Venn Severin	1	9½x10½	350	2,150	2	Hot Bulb
26	Jacobson	2	7¼x8¼	450	2,600	3	Hot Bulb
30	Fairbanks Morse C.O.	2	8½x10	400	5,050	2	Hot Bulb
30	G. G.	2	8½x9½	450	6,700	3	Hot Bulb
30	Jacobson	1	10 x11	375	3,400	2	Hot Bulb
30	Jacobson	3	6½x7	500	2,400	3	Hot Bulb
30	Mietz	2	.....	...	...	..	Hot Blub
30	Mianus	2	7 π x9⅜	360	5,100	2	Diesel
30	Missouri	4	5 x6	500	2,800	3	Hot Bulb
32	Remington	4	5½x6	500	1,750	3	Hot Bulb
33	Jacobson	2	8 x8¼	450	2,900	3	Hot Bulb
34	Remington	3	6¾x6	500	1,850	3	Hot Bulb
35	Jacobson	1	11 x13	340	4,500	2	Hot Bulb
35	Remington	2	8¼x8	400	3,130	3	Hot Bulb
37	Remington	3	7 x8	400	3,400	3	Hot Bulb
38	Skandia	2	8⅞x10	375	5,450	..	Semi-Deisel
40	Jacobson	1	12 x13	340	5,000	2	Hot Bulb
40	Jacobson	2	8½x9½	410	4,000	2	Hot Bulb
40	Jacobson	3	7¼x8¼	450	3,500	3	Hot Bulb
40	Jacobson	4	6½x7	500	3,000	3	Hot Bulb
40	Venn Severin	2	8 x10	350	3,380	2	Hot Bulb
45	Fairbanks Morse C.O.	3	8½x10	400	6,870	2	Hot Bulb
45	G. G.	2	9½x11	380	10,000	3	Hot Bulb
45	Mianus	3	7 π x9⅜	360	7,400	2	Diesel
45	Mietz	3	.....	...	...	..	Hot Bulb
45	Venn Severin	1	12¼x13½	300	4,900	2	Hot Bulb
45	Venn Severin	2	9½x10½	350	3,950	2	Hot Bulb
45	Weiss Oil Engine	3	.....	425	4,500	Weiss	Opt.
46	Remington	4	6¾x6	500	2,000	3	Hot Bulb
50	Jacobson	2	9½x9½	410	4,300	2	Hot Bulb
50	Jacobson	3	8 x8¼	450	3,800	3	Hot Bulb
52	Jacobson	4	7¼x8¼	450	4,400	3	Hot Bulb
55	Remington	3	8¼x8	400	4,500	3	Hot Bulb
55	Skandia	2	10¾x11⅜	375	7,800	..	Semi-Deisel
60	Fairbanks Morse C.O.	4	8½x10	400	8,000	2	Hot Bulb
60	G. G.	2	10½x12½	340	14,000	3	Hot Bulb
60	G. G.	4	8½x9½	450	16,500	3	Hot Bulb
60	Jacobson	2	10 x11	375	4,900	2	Hot Bulb
60	Jacobson	3	8½x9½	410	5,300	2	Hot Bulb
60	Mianus	4	7 π x9⅜	360	9,500	2	Diesel
60	Mietz	3	.....	...	...	..	Hot Bulb
60	Weiss Oil Engine	3	.....	385	6,000	Weiss	Opt.
65	Jacobson	4	8 x8¼	450	4,700	3	Hot Bulb
70	Jacobson	2	11 x13	340	7,000	2	Hot Bulb
70	Kahlenberg	2	.....	340	8,000	2	Hot Bulb
70	Venn Severin	3	9½x10½	350	4,800	2	Hot Blub
70	Skandia	2	11 x14	325	9,250	..	Semi-Diesel
75	Fairbanks Morse C.O.	3	10½x12½	340	14,800	2	Hot Bulb
75	Jacobson	3	9½x9½	410	5,600	2	Hot Bulb
75	Mietz	..	.....	...	...	..	Hot Bulb
75	Remington	4	8¼x8	400	5,430	3	Hot Bulb
75	Weiss Oil Engine	3	.....	360	7,500	Weiss	Opt.
80	G. G.	2	11½x14	320	19,000	3	Hot Bulb
80	Jacobson	2	12 x13	340	7,500	2	Hot Bulb
80	Jacobson	4	8½x9½	410	6,400	2	Hot Bulb
90	G. G.	4	9½x11	380	18,500	3	Hot Bulb
90	Jacobson	3	10 x11	375	6,400	2	Hot Bulb
100	Jacobson	4	9½x9½	410	6,800	2	Hot Bulb
100	Kahlenberg	3	.....	340	10,000	2	Hot Bulb
100	Fairbanks Morse C.O.	4	10½x12½	340	17,600	2	Hot Bulb
100	Skandia	2	14 x15¾	275	17,500	..	Semi-Diesel
100	Venn Severin	2	12¼x13½	275	7,900	2	Hot Bulb
105	Jacobson	3	11 x13	340	8,500	2	Hot Bulb
120	Jacobson	3	12 x13	340	9,000	2	Hot Bulb
120	Jacobson	4	10 x11	375	8,000	2	Hot Bulb
120	Skandia	2	14 x15¾	300	17,500	..	Semi-Diesel
120	Weiss Oil	3	.....	300	12,000		Weiss Opt.
125	G. G.	4	10½x12½	340	32,500	3	Hot Bulb
130	Kahlenberg	4	.....	340	15,000	2	Hot Bulb
140	Jacobson	4	11 x13	310	8,500	2	Hot Bulb
140	Skandia	4	11 x14	325	16,000	..	Semi-Diesel
150	Fairbanks Morse C.O.	3	14 x18	250	29,400	2	Hot Bulb
150	Venn Severin	3	12¼x13½	275	12,500	2	Hot Bulb
150	Weiss Oil Engine	3	.....	280	15,500	Weiss	Opt.
160	Jacobson	4	12 x13	310	9,000	2	Hot Bulb
180	G. G.	4	11½x14	320	40,000	3	Hot Bulb
200	Fairbanks Morse C.O.	4	14 x18	250	38,000	2	Hot Bulb
200	Venn Severin	4	12¼x13½	275	14,700	2	Hot Bulb
200	Weiss Oil Engine (direct reversing)	4	.....	280	20,000	Weiss	Opt.
225	Weiss Oil Engine	3	.....	258	22,000	Weiss	Opt.
240	G. G.	4	13¼x15	280	47,000	3	Hot Bulb
240	Skandia	4	14 x15¾	300	23,000	..	Semi-Diesel
300	Weiss Oil Engine	3	.....	245	30,000	Weiss	Opt.
300	Weiss Oil Engine	4	.....	258	30,000	Weiss	Opt.
300	Fairbanks Morse C.O.	6	14 x18	250	53,200	2	Hot Bulb
350	Mietz	4	.....	...	...	..	Hot Bulb
360	G. G.	4	17 x20	210	51,200	3	Hot Bulb
360	Skandia	4	16½x19	250	46,000	..	Semi-Diesel
400	Weiss Oil Engine	4	.....	245	40,000	Weiss	Opt.
500	Bolinders	4	.....	...	...	..	Hot Bulb
500	Skandia	6	16½x19	225	70,000	..	Semi-Diesel
550	G. G.	6	17 x20	210	77,850	3	Hot Bulb
650	Busch Sulzer	4	.....	160	200,000	..	Diesel
1,150	Busch Sulzer	4	.....	135	380,000	..	Diesel
1,850	Busch Sulzer	4	.....	110	735,000	..	Diesel

Two-Cycle Heavy-Oil Engines

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	Location of Valves	Ignition
12½	Burnoil	1	6¾x9	425	4,200	H	Diesel
25	Burnoil	2	6¾x9	425	5,200	H	Diesel
25	Western	1	9¼x14	325	...	H	Diesel
30	Quayle	4	4½x6½	600	2,150	H	Diesel
37½	Burnoil	3	6¾x9	425	6,700	H	Diesel
50	Burnoil	4	6¾x9	425	7,900	H	Diesel
50	Fulton	3	8 x9	400	9,000	L	Diesel
50	Pittsburgh	2	8½x12	400	12,000	H	Diesel
50	Western	2	9¼x14	325	12,940	H	Diesel
60	Midwest Diesel	2	9 x13	350	14,000	..	Diesel
70	Fulton	4	8 x9	400	10,000	L	Diesel
75	Burnoil	6	6¾x9	425	10,400	H	Diesel
75	Pittsburgh	3	8½x12	400	15,500	H	Diesel
75	Western	3	9¼x14	325	16,750	H	Diesel
90	Midwest Diesel	3	9 x13	350	90,000	..	Diesel
100	Fulton	6	8 x9	400	13,000	L	Diesel
100	Pittsburgh	4	8½x12	400	18,000	H	Diesel
100	Western	4	9¼x14	325	20,000	H	Diesel
120	Midwest Diesel	4	9 x13	350	25,000	..	Diesel
120	Nelseco Diesel	4	.....	350	16,500	H	Diesel
150	Pittsburgh	6	8½x12	400	24,000	H	Diesel
150	Western	6	9¼x14	325	27,000	H	Diesel
180	Midwest Diesel	6	9 x13	350	35,000	..	Diesel
180	Nelseco Diesel	6	.....	350	21,800	H	Diesel
200	Winton	6	11 x14	250	...	H	Diesel
200-600	Ingersoll Rand P. R. Type	..	.....	...	...	..	.....
240	Nelseco Diesel	8	.....	350	28,200	H	Diesel
300	Winton	6	12 15/16x18	210	...	H	Diesel
320	Dow	6	.....	...	...	H	Diesel
360	Nelseco Diesel	6	.....	240	48,700	H	Diesel
390	McIntosh & Seymour	6	.....	265	...	H	Diesel
425	Dow	6	.....	...	...	H	Diesel
500	Dow	6	.....	...	...	H	Diesel
550	Werkspoor	6	16½x20½	165	160,000	..	Diesel
640	McIntosh & Seymour	6	.....	190	...	H	Diesel
666	Dow	6	.....	...	...	H	Diesel
825	Werkspoor	6	20½x35½	135	720,000	..	Diesel
960	McIntosh & Seymour	6	.....	135	...	H	Diesel
1,100	Werkspoor	6	23½x41¾	115	320,000	..	Diesel
1,150	McIntosh & Seymour	6	.....	140	...	H	Diesel
1,300	McIntosh & Seymour	6	.....	138	...	H	Diesel
1,500	Werkspoor	6	27½x47¾	100	400,000	..	Diesel
1,550	McIntosh & Seymour	6	.....	115	...	H	Diesel
2,000	McIntosh & Seymour	6	.....	105	...	H	Diesel
2,000	Werkspoor	6	31½x53	90	550,000	..	Diesel

Steam Plants

Rated H. P.	Manufacturer	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	Type
50	Talbot	4	5 x5	400	1,700	Uniflow Engine
100	Talbot	4	5 x6	400	2,500	Uniflow Engine
200	Talbot	4	6¾x6⅜	400	4,750	Uniflow Engine
400	Talbot	4	8 x8	400	9,300	Uniflow Engine
600	Talbot	4	8¼x8¼	400	14,000	Uniflow Engine
1,000	Talbot	4	10 x10	400	24,000	Uniflow Engine
1,500	Talbot	4	11¾x11¾	400	35,000	Uniflow Engine
2,000	Talbot	4	13½x13½	400	46,800	Uniflow Engine

American Manufacturers of Four-Cycle Motors

An Alphabetical List of Four-Cycle Marine Motors with the Names and Addresses of Their Manufacturers, Giving the Range of Powers Produced by Each

Four-Cycle Gasoline and Kerosene Engines

Automatic.....The Automatic Machine Co., Bridgeport, Conn.
3, 6, 9, 12, 18, 24, 25, 37, 50, 75, 100 H. P.: 1-6 cyls.

Anderson.....Anderson Engine Co., 4032 N. Rockwell St., Chicago, Ill.
4, 8, 12, 24, 50 H. P.: 1-4 cyls.

Acme.....Acme Engine Co., 11 Minna St., San Francisco, Cal.
8, 10, 16, 20, 25, 27, 35, 40, 45, 50, 55, 65, 80, 85, 100, 125 H. P. 1-6 cyls.

Atlas Imperial.....Atlas Imperial Eng. Co., Ft. 19th Ave., Oakland, Cal.
6, 8, 10, 12, 16, 20, 30, 35, 45, 50, 55, 60, 80, 90, 110, 125, 150 H. P. 1-4 cyls.

Aristocrat.....Caille Perfection Motor Co., Detroit, Mich.
14 H. P. 4 cyls.

Brennan.....Brennan Motor Mfg. Co., Syracuse, N. Y.
20, 35, 40, 50, 60, 80 H. P. 4-6 cyls.

Barber.....Barber Bros., King Bros., Successors, Syracuse, N. Y.
3 H. P. 1 cyl.

Bridgeport.....Bridgeport Motor Co., Inc., Bridgeport, Conn.
14, 30, 45, 60 H. P. 2-4 cyls.

Buffalo.....Buffalo Gasoline Motor Co., Buffalo, N. Y.
4, 6, 12, 15, 20, 22, 24, 30, 45, 60, 70, 80, 100, 150 H. P. 1-6 cyls.

Boyer.....Boyer Machine Co., East Oakland, Cal.
5, 10 H. P. 1-2 cyls.

Cottrell-Holmes.....C. B. Cottrell & Sons, Co., Westerly, R. I.
40, 100, 150, 200, 300 H. P. 2-12 cyls.

Chesapeake.....Chesapeake Engine Co., Oxford, Md.
7 H. P. 1 cyl.

Cady of Canastota...C. N. Cady Co., Inc., Canastota, N. Y.
16 H. P. 4 cyls.

Carl.....Carl Engine Wks., 103 N. 2nd St., Philadelphia, Pa.
4, 5, 6, 8, 12, 14, 16, 24, 28 H. P. 1-4 cyls.

Carson.....Carson Motor Co., 616 Penobscot Bldg., Detroit, Mich.
15 H. P. 4 cyls.

Doak.....Doak Gas Engine Co., Oakland, Cal.
30, 40, 45, 60, 75, 90, 100, 150, 200, 300 H. P. 2-6 cyls.

Dupont.....Delaware Marine Motor Co., Commerce St., Wilmington, Del.
20, 40, 60 H. P. 2-6 cyls.

Dunn.....Dunn Motor Wks., Ogdensburg, N. Y.
2, 4, 6, 8, 12, 16, 24 H. P. 1-6 cyls.

Doman.....H. C. Doman Corp., Oshkosh, Wis.
7, 15, 20, 40, 50 H. P. 1-4 cyls.

Evansville.....Evansville Gas Engine Wks., 1230 Riverside Ave., Evansville, Ind.
3¾, 5, 7½, 8, 10, 11, 15, 16, 20, 22, 24, 32, 33, 44 H. P. 1-4 cyls.

Elbridge Standardized..Elbridge Automotive Corp., Sandusky, O.
22 H. P. 4 cyls.

Elco.....The Elco Co., Bayonne, N. J.
65, 100 H. P. 4-6 cyls.

Enterprise.....Enterprise Foundry Co., 20 Stewart St., San Francisco, Cal.
6 to 150 H. P. 1-6 cyls.

F & B.....Fay & Bowen Engine Co., Geneva, N. Y.
17, 22, 40, 45, 50, 75 H. P. 4-6 cyls.

Fisherman.....Loane Engineering Co., Baltimore, Md.
4, 6, 12, 18, 24 H. P. 1-4 cyls.

Foreman.....Foreman Motor & Machine Co., Ltd., Lake St., Toronto, Ont., Can.
6, 12, 15, 30, 45 H. P. 2-6 cyls.

Frisbie (Valve-in-head)..Frisbie Motor Co., Middletown, Conn.
5, 7, 10, 16, 18, 25, 30, 40, 50, 75 H. P. 1-6 cyls.

Frisco Standard.....Standard Gas Engine Co., Oakland, Cal.
5, 8, 10, 12, 16, 20, 25, 30, 40, 50, 65, 80, 85, 110, 120, 175, 275 H. P. 1-6 cyls.

Guarantee.....Guarantee Motor Co., 369 Bay St. North, Hamilton, Ont., Can.
4, 5, 7, 8, 10, 14, 16, 20, 25, 35, 50, 60 H. P. 1-4 cyls.

Gilmore.....Gilmore Marine Motor Corp., 404 24th St., Detroit, Mich.
5, 10 H. P. 2-4 cyls.

Gray-Prior.....Gray & Prior Machine Co., 56 Suffield St., Hartford, Conn.
36 H. P. 4 cyls.

Gray.....Gray Motor Co., 2108 Mack Ave., Detroit, Mich.
25, 35, 45 H. P. 4 cyls.

Gaeth.....Gaeth Motors Co., 2101 Abbey Ave., Cleveland, O.
18, 27, 36, 54 H. P. 2-6 cyls.

Hall-Scott.....Hall Scott Motor Car Co., Inc., West Berkeley, Cal.
125, 200 H. P. 4-6 cyls.

H. L. B......H. L. Brownback Co., Norristown, Pa.
4 H. P. 2 cyls.

Hettinger.....Hettinger Engine Co., Bridgeton, N. J.
6, 9, 12, 18, 25, 36, 50 H. P. 1-4 cyls.

Hunter.....Everett Hunter Boat Co., McHenry, Ill.
10, 12, 20 H. P. 4 cyls.

Honest Clay.....The Clay Engine Mfg. Co., 664 E. 72nd St., Cleveland, O.
6, 8, 10, 14, 18, 22, 35, 42, 50, 100 H. P. 1-4 cyls.

Harris.....Harris Marine Engine Co., 205 West Front St., Wilmington, Del.
10, 15, 18, 30, 50, 70, 100, 115, 175 H. P. 2-6 cyls.

Hicks.....Hicks Iron Wks., 967 Howard St., San Francisco, Cal.
6, 8, 10, 12, 16, 20, 30, 35, 80 H. P. 1-3 cyls.

Imperial.....Bruce Stewart & Co., Ltd., Charlottetown, P. E. I.
40 H. P. 4 cyls.

J. V. B......J. V. B. Engine Co., 911 So. High St., Akron, O.
25, 60 H. P. 4 cyls.

Jacobson.....Jacobson Engineering Co., Inc., 30 Church St., New York. N. Y.
22 H. P. 4 cyls.

Kermath.....Kermath Mfg. Co., Detroit, Mich.
12, 16, 20, 40 H. P. 4 cyls.

Knox.....Camden Anchor-Rockland Machine Co., Camden, Me.
6, 8, 12, 16, 25, 50, 75 H. P. 1-6 cyls.

Knox Model 350 Marine Motor.....Knox Motors Co., Springfield, Mass.
46 H. P. 4 cyls.

L-A.....Lockwood-Ash Motor Co., Jackson, Mich.
14 H. P. 4 cyls.

Lathrop.....J. W. Lathrop Co., Mystic, Conn.
12, 16, 21, 25, 30, 40 H. P. 2-4 cyls.

LeRoi.....LeRoi Co., Mitchell St. and 60th Ave., Milwaukee, Wis.
9-12 H. P. 4 cyls.

M & T.....Murray & Tregurtha Corp., Atlantic, Mass.
18, 28, 40, 60, 100, 400 H. P. 2- cyls.

Mianus.....Mianus Motor Wks., Stamford, Conn.
16, 24, 32 H. P. 2-4 cyls.

Miller.....Miller Engine Co., Chicago, Ill.
4, 6, 10, 14, 20 ,22, 30, 35, 50 H. P. 1-4 cyls.

Motorgo.....Sears, Roebuck & Co., 925 Homan Ave., Chicago, Ill.
16 H. P. 4 cyls.

Niagara.....Niagara Motors Corp., Dunkirk, N. Y.
12, 40, 80, 120, 160 H. P. 2-8 cyls.

Nieland.....J. E. Nieland Co., 1728 Bryant St., San Francisco, Cal.
1½, 2, 2½, 4, 6, 8, 12, 16, 18, 20, 24 H. P. 1-3 cyls.

N & S.....N. & S. Engine Co., 1144 Elliott Ave., Seattle, Wash.
20, 30, 40, 80 H. P. 2-6 cyls.

Olympic.....Woodhouse Gasoline Engine Co., Seattle, Wash.
4, 8 H. P. 1-2 cyls.

Pacific Heavy-Duty...Pacific Marine Engine Co., 78 Marion St., Seattle, Wash
7, 15 H. P. 1-2 cyls.

Palmer.....Palmer Bros. Engines, Inc., Cos Cob, Conn.
3½, 5, 6, 6½, 11, 12, 15, 18, 20, 24, 25, 26, 35, 50, 60 80 H. P. 1-6 cyls.

Ralaco.....S. M. Jones Co., Toledo, O.
10, 15, 20, 25, 30, 45, 50, 80 H. P. 2-6 cyls.

Red Wing.....Red Wing Motor Co., Red Wing, Minn.
14, 20, 24, 36, 40 H. P. 4 cyls.

Regal.....Regal Gasoline Engine Co., Coldwater, Mich.
2, 4, 5, 7, 8, 9, 10, 14, 18, 20, 30, 32, 36, 50 H. P. 1-4 cyls.

Reliable 2-cyl. opp...Reliable Tractor & Engine Co., Portsmouth, O.
10, 16, 25, 32, 45 H. P. 2 cyls. opposed.

Roberts.....Roberts Motor Co., Sandusky, O.
8 H. P. 2 cyls.

Scripps.....Scripps Motor Co., 631 Lincoln Ave., Detroit, Mich.
15, 20, 35, 45, 50, 75 H. P. 2-6 cyls.

Speedway.....Consolidated Shipbuilding Corp., Morris Heights, N. Y.
28, 44, 66, 75, 115, 130, 150, 160, 175, 200, 250 H. P. 4-8 cyls.

Standard Kld.....Seattle Standard Engine Co., Seattle, Wash.
3½, 4, 7, 8, 14 H. P. 1-2 cyls.

Standard.....Standard Motor Construction Co., 180 Whiton St., Jersey City, N. J.
12, 18, 24, 27, 37, 50, 54, 70, 75, 100 ,150, 220, 300, 500 H. P. 2-6 cyls.

Sterling.....Sterling Engine Co., 1252 Niagara St., Buffalo, N. Y.
10, 15, 25, 55, 85, 100, 115, 125, 145, 150, 170, 200, 225, 250, 300 H. P. 2-8 cyls.

Sturtevant.....D. F. Sturtevant Co., Hyde Park, Boston, Mass.
75 H. P. 4 cyls.

Superior.....Superior Motor Works, Jackson, Mich.
6, 12, 25 H. P. 1-4 cyls.

Trego Model No. 17..Trego Motors Corp., New Haven, Conn.
28 H. P. 2 cyls.

Treiber.....Treiber Products Co., Yonkers, N. Y.
35 H. P. 4 cyls.

Twentieth Century..New York Yacht, Launch & Engine Co., Morris Heights, N. Y.
20, 50, 75 H. P. 2-6 cyls.

Union.....Union Gas Engine Co., Oakland, Cal.
5, 12, 20, 35, 45, 60, 80, 85, 110, 125, 150, 225, 250, 300, 325, 375 H. P. 1-6 cyls.

Universal.....Universal Motor Co., Oshkosh, Wis.
12 H. P. 4 cyls.

Van Blerck.....Van Blerck Motor Co., Monroe, Mich.
100, 150, 200 H. P. 4-8 cyls.

Vulcan.....Vulcan Engine Works, 1827 Bainbridge St., Philadelphia, Pa.
4, 5, 7½, 8, 10, 11, 15, 16, 20, 22, 25, 30, 35, 40, 45, 56, 70, 75 H. P. 1-6 cyls.

Winton.....Winton Engine Wks., 2116 West 106th St., Cleveland, O
80, 125, 150, 200 H. P. 6-8 cyls.

Wisconsin.....Wisconsin Motor Mfg. Co., Sta. A., Milwaukee, Wis.
18, 22, 24, 30, 40, 42, 46, 54, 55, 57, 62, 65, 80, 85, 90 H. P. 4-6 cyls.

Wolverine.....Wolverine Motor Wks., Bridgeport, Conn.
5, 14, 22, 32, 40, 42, 60, 80, 110, 160, 200 H. P. 1-6 cyls.

Wood & Chute.....Wood & Chute, Inc., Greenport, N. Y.
16, 24, 32 H. P. 2-4 cyls.

Wright Reliable.....Wright Machine Co., Owensboro, Ky.
20, 30, 40, 45, 60, 90 H. P. 2-6 cyls.

Four-Cycle Outboard Motors

Airdrive.....Kemp Machine Wks., Muncie, Ind.
3, 10 H. P. 2 cyls.

Evinrude.....Evinrude Motor Co., 279 Walker St., Milwaukee, Wis.
4 H. P. 2 cyls.

Joymotor.....Joymotor Mfg. Co., 332 S. Michigan Ave., Chicago, Ill.
2 H. P. 1 cyl.

Four-Cycle Heavy Oil Engines

Atlas Diesel.....Atlas Imperial Engine Co., Oakland, Cal.
100 H. P. and up, 4-6 cyls.

Burnoil.....Dodge Manufacturing Co., Mishawaka, Ind.
12½, 25, 37½, 50, 75 H. P. Hvid type, 1-6 cyls.

Craig.....James Craig Engine & Machine Works, 807 Garfield Ave., Jersey City, N. J.

De La Vergne.....De La Vergne Machine Co., E. 138th St., New York, N.Y.
400, 800 H. P. 4-8 cyls.

Dow.....Dow Pump & Diesel Co., Alameda, Cal.
320 to 1000 H. P. 6 cyls.

Fulton.....Fulton Mfg. Co., Erie, Pa.
50, 70, 100 H. P. 3-6 cyls.

Ingersoll-Rand. P. R. Type..Ingersoll-Rand Co., 11 Broadway, New York N. Y.
200, 600 H. P. 6 cyls.

Midwest Diesel.....Midwest Engine Co., Indianapolis, Ind.
60, 90, 120, 180 H. P. 2-6 cyls.

McIntosh & Seymour.McIntosh & Seymour Corp., Auburn, N. Y
390, 640, 960, 1150, 1300, 1550, 2000 H. P. 6 cyls.

Nelseco.....New London Ship & Engine Co., Groton, Conn.
120, 180, 240, 360 H. P. 4, 6, 8 cyls.

Nordberg.....Nordberg Manufacturing Co., Milwaukee, Wis.
330 to 2800 H. P.

Pittsburgh.....Pittsburgh Filter & Eng. Co., 280 Broadway, New York. N. Y.
50, 75, 100, 150 H. P. 2-6 cylinders.

Quayle.....Commonwealth Motors Co., 326 W. Madison St. Chicago, Ill.
30 H. P. 4 cyls.

Schneider.....Schneider & Cie, 21 E. 40th St., New York, N. Y.
Up to 2400 H. P. 8 cyls.

Workspoor.....Skandia Pacific Oil Engine Co., Oakland, Cal.
550, 825, 1100, 1500, 2000 H. P. 6 cyls.

Western.....Western Machinery Co., Los Angeles, Cal.
25, 50, 75, 100, 150 H. P. 1-6 cyls.

Winton.....Winton Engine Works, 2116 W. 106th St., Cleveland, O.
50, 75, 115, 150, 225, 300, 450 H. P. 3-8 cyls.

Four-Cycle Marine Motors for 1920

The initials used in the column under Location of Valves have the following meaning: L, both inlet and exhaust valves on same side of cylinder; T, inlet and exhaust valves on opposite sides of cylinder; H, valves in cylinder head. The initials used in the column under Ignition indicate the standard equipment furnished and have the following meanings: M & B, make and break system with battery and coil or low-tension magneto; B & M, both battery and high-tension magneto system; M, high-tension magneto; M I S, magneto with impulse starter; J S, jump spark battery and coil system; B Dist., battery with distributor; Dual M, two separate high-tension magneto systems operating independently; D M D, dual magneto and distributor; D, Delco system; Opt., purchaser has the option of make and break or jump spark systems.

Motors Under 6 Horsepower

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	Location of Valves	Ignition
1½	Nieland	1	3 x3½	700	...	L	Opt.
2	Dunn	1	3¾x4	500	100	L	J. S.
2	Nieland	1	3½x4	500	275	L	Opt.
2	Regal	1	3¼x3½	800	125	L	J. S.
2½	Nieland	1	4 x4½	500	275	L	M. & B.
3	Automatic	1	4¼x5	500	300	L	Opt.
3	Barber	1	3½x5	600	135	..	J. S.
3½	Palmer	1	4½x4½	600	350	T	J. S.
3½	Standard Kid	1	3¾x3¾	750	110*	H	Opt.
3¾	Evansville	1	4½x5	500	300	H	J. S.
4	Anderson	1	4½x5	550	400	T	J. S.
4	Buffalo	2	3 x4	700	240	L	J. S.
4	Carl	1	4½x5	450	225	L	J. S.
4	Dunn	2	3¾x4	600	215	L	J. S.
4	Fisherman	1	3¾x5	550	...	H	J. S.
4	Guarantee	1	4½x4½	...	...	..	J. S.
4	H. L. B.	2	2½x5	1,200	120	L	B. D.
4	Honest Clay	1	4½x5	500	450	H	J. S.
4	Miller	1	4½x5	600	400	L	M.
4	Nieland	1	5 x6	400	525	L	M. & B.
4	Nieland	2	3½x4	700	400	L	J. S
4	Olympic	1	3¾x4½	700	225	..	.....
4	Regal	1	4 x4½	800	290	L	J. S.
4	Standard Kid	1	3¾x4¾	700	165*	H	Opt.
4	Vulcan	1	4½x6	500	450	T	J. S
5	Carl	1	5 x6	425	290	L	J. S.
5	Evansville	1	5 x6	500	400	H	J. S.
5	Frisco Standard	1	5¾x6½	400	850	H	M. & B.
5	Frisbie Valve-in-head	1	4¾x5	550	325	H	Opt.
5	Gilmore	2	3 x3½	750	135	H	J. S.
5	Guarantee	1	5½x4½	...	...	..	J. S.
5	Palmer	1	4½x6	600	375	T	J. S.
5	Regal	1	4½x5½	600	380	L	J. S.
5	Union	1	5¾x6½	400	640	..	M. & B.
5	Vulcan	1	5¼x7	500	650	T	J. S.
5	Wolverine	1	5½x6	500	494	L	J. S.
6	Atlas Imperial	1	.....	400	925	H	M. & B.
6	Automatic	1	5½x7	400	643	L	Opt.
6	Automatic	2	4¾x5	500	525	L	Opt.
6	Buffalo	2	3½x5	600	400	L	J. S.
6	Carl	1	6 x8	350	390	L	J. S.
6	Dunn	3	3¾x4	600	250	L	J. S.
6	Fisherman	1	5 x6	550	800	H	J. S.
6	Hettinger	1	5½x6	450	400	L	M. & B.
6	Hicks	1	6 x7	425	950	H	M. & B.
6	Honest Clay	1	5½x7	375	900	H	J. S.
6	Miller	1	5¾x6	500	500	L	M.
6	Nieland	1	6 x7½	350	750	L	M. & B.
6	Nieland	2	4 x5	550	525	L	M. & B.
6	Palmer	1	5 x6	600	400	T	J. S.
6	Superior	1	4½x6	750	...	H	J. S.

6½ to 10 Horsepower Four-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	Location of Valves	Ignition
6½	Palmer	1	5½x6	600	425	T	J. S
7	Chesapeake	1	5 x6	600	500	L	M
7	Doman	1	5 x6	600	500	T	J. S.
7	Frisbie Valve-in-head	1	6 x6	450	500	H	Opt.
7	Guarantee	1	6 x5	...	...	..	J. S.
7	Pacific Heavy-Duty	1	6 x7	400	780	H	J. S.
7	Regal	1	5¼x6½	550	760	L	Opt.
7	Standard Kid	2	3¾x3¾	750	175*	..	.....
7	Standard Kid	1	5 x6	600	500	..	Opt.
7½	Evansville	2	4½x5	500	400	H	J. S.
7½	Vulcan	1	6½x7¼	450	850	T	J. S.
8	Acme	1	6¾x7½	360	1,470	H	Opt
8	Anderson	2	4½x5	550	550	T	J. S.
8	Atlas Imperial	1	.....	400	1,075	H	M. & B.
8	Carl	2	4½x5	500	350	L	J. S.
8	Dunn	2	4¼x5	700	300	L	J. S.
8	Evansville	1	6 x6¼	500	675	H	J. S.
8	Frisco Standard	2	4¾x6	440	1,000	H	Opt.
8	Guarantee	1	6 x7	...	...	..	J. S.
8	Guarantee	2	4½x4½	...	...	..	J. S.
8	Hicks	1	6½x7½	425	1,100	H	M. & B.
8	Honest Clay	1	6½x7	375	950	H	Opt.
8	Honest Clay	2	4½x5	500	700	H	J. S.
8	Knox	1	5½x6¼	500	550	T	J. S.
8	Nieland	1	6½x8	325	900	L	M. & B.
8	Nieland	2	5 x6	400	800	L	M. & B.
8	Olympic	2	3¾x4½	700	350	..	.....
8	Regal	2	4 x4½	800	520	L	J. S
8	Roberts	2	3¾x4	1,000	190	L	Opt.
8	Vulcan	2	4½x6	550	700	T	J. S.
9	Automatic	3	4½x5	500	760	L	Opt.
9	Hettinger	2	4½x6	500	500	L	J. S.
9	Le Roi	4	2½x4	1,000	330	L	Opt.
9	Regal	1	6½x7	500	1,230	L	Opt.
10	Acme	1	7¼x9	340	1 850	H	Opt.
10	Atlas Imperial	2	.....	435	1,350	H	M. & B.
10	Evansville	2	5 x6	500	530	H	J. S.
10	Frisbie Valve-in-head	2	4¾x5	550	430	H	Opt.
10	Frisco Standard	2	5½x6	400	1,320	H	Opt.
10	Gilmore	4	3 x3½	750	225	H	J. S.
10	Guarantee	1	7 x7	...	...	..	J. S.
10	Guarantee	2	5½x4½	...	...	..	J. S.
10	Harris	2	5 x5½	450	550	..	Opt.
10	Hicks	1	7½x8½	400	1,500	H	M. & B.
10	Honest Clay	1	7½x7	275	1000	H	J. S.
10	Hunter	4	2½x4	800	260	L	B. & M.
10	Miller	2	4½x6	600	600	L	M
10	Palmer	2	4½x4½	650	325	L	J. S.
10	Ralaco	2	4 x6	600	860	H	J. S.
10	Regal	2	4½x5½	600	725	L	J. S.
10	Reliable	2 opp.	5 x5	600	1,050	H	B. M.
10	Standard Kid	2	3¾x5	700	250	..	Opt.
10	Sterling	4	2¾x4½	1,000	250	L	M
10	Vulcan	2	5¼x7	500	950	T	J. S.

11 to 15 Horsepower Four-Cycle Motors

Rated H. P.	Motor	No. o Cyls.	Bore & Stroke	R.P.M.	Wt.	Location of Valves	Ignition
11	Evansville	1	7 x9	350	1,050	H	J. S.
11	Palmer	2	4½x6	600	650	T	J. S.
11	Vulcan	1	7½x8½	400	1,100	T	J. S.
12	Anderson	2	5 x6	500	1,000	T	M.
12	Atlas Imperial	2	.....	425	1,425	H	M. & B.
12	Automatic	2	5½x7	400	1,115	L	Opt.
12	Buffalo	2	5 x6½	400	1,170	L	J. S
12	Carl	2	5 x6	475	550	L	J. S.
12	Dunn	3	4¾x5	700	375	L	J. S.
12	Fisherman	2	5 x6	550	1,100	H	J. S.
12	Frisco Standard	2	6 x7	380	1,690	H	Opt.
12	Hettinger	2	5½x6	450	600	L	M. & B.
12	Hicks	2	6 x7	425	2,200	H	M. & B.
12	Honest Clay	2	5½x7	400	1,675	H	J. S.
12	Hunter	4	3¼x4½	800	280	L	M.
12	Kermath	4	3½x4	1,200	470	L	M.
12	Knox	2	5 x5¼	550	600	T	J. S.
12	Lathrop	2	5 x6½	450	...	T	J. S.
12	Le Roi	4	3½x4½	1,000	350	L	Opt.
12	Niagara	2	4¾x5½	900	625	T	B. & M.
12	Nieland	2	6 x7	375	1,200	L	M. & B
12	Palmer	2	5 x6	600	750	T	J. S.
12	Standard	2	5 x6½	450	850	L	M. & B.
12	Superior	2	4½x6	750	...	H	J. S.
12	Union	2	6 x7	400	1,290	..	M. & B.
12	Universal	4	2½x4	1,200	300	L	M.
14	Aristocrat	4	3½x4	950	664	T	M.
14	Bridgeport	2	5½x6½	500	850	L	M.
14	Carl	2	6 x8	400	650	L	J. S.
14	Guarantee	2	6 x5	...	...	..	J. S.
14	Guarantee	4	3¾x4	...	...	..	J S.
14	L-A	4	3¾x4½	900	...	L	M.
14	Miller	2	5½x6½	500	800	L	M.
14	Red Wing	4	2¾x4	1,000	300	L	M.
14	Regal	2	5½x6½	550	985	L	Opt.
14	Wolverine	2	6½x7	425	1,279	L	J. S.
15	Buffalo	2	6 x7½	350	1,400	L	J. S.
15	Carson	4	2½x4	1,800	400	L	Opt.
15	Doman	2	4¾x6	800	600	T	J. S.
15	Evansville	4	4½x5	500	625	H	J. S.
15	Foreman	2	5½x7	500	1,150	H	B. & M.
15	Harris	2	5½x6¼	500	900	..	Opt.
15	Pacific Heavy-Duty	2	6 x7	400	1,500	H	J. S.
15	Palmer	3	4½x6	600	900	T	J. S.
15	Ralaco	2	5 x7	500	860	H	J. S.
15	Scripps	2	4¼x6	900	700	L	M.
15	Standard Kid	2	4¾x6	600	600	..	Opt.
15	Sterling	2	5½x7	500	1,065	L	M.
15	Vulcan	2	6½x7¼	475	1 350	T	J. S.

16 to 20 Horsepower Four-Cycle Motors

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M	Wt.	Location of Valves	Ignition
16	Acme	2	6¾x7½	360	1,850	H	O.
16	Atlas Imperial	2	.....	380	2,475	H	M. & B.
16	Cady of Canastota	4	3¾x4	1,000	365	L	B. Dist.
16	Carl	4	4½x5	750	650	L	J. S.
16	Dunn	4	4¾x5	700	475	L	J. S.
16	Evansville	2	6x 6¼	500	925	H	J. S.
16	Frisco Standard	2	6¾x7½	360	1,785	H	Opt.
16	Guarantee	2	6 x7	...	...	..	J. S.
16	Hicks	2	6½x7½	425	2,500	H	M. & B.
16	Honest Clay	2	6½x7	400	1,750	H	J. S.
16	Kermath	4	3¾x4	1,200	500	L	M.
16	Knox	2	5½x6¼	500	900	T	J. S.
16	Lathrop	2	5½x6½	450	...	T	J. S.
16	Mianus	2	6 x8	400	1 600	T	Opt.
16	Motorgo	4	3¾x4½	800	650	..	M.
16	Nieland	2	6½x8	325	1 400	L	M. & B.
16	Reliable	2 opp.	6 x6	550	1,650	H	B. & M.
16	Vulcan	4	4½x6	550	1,000	T	J. S.
16	Wood & Chute	2	6 x7	400	1 300	L	J. S.
17	Fay & Bowen	4	3¼x4½	1,400	450	L	M.
18	Automatic	3	5½x7	400	1,425	L	Opt.
18	Fisherman	3	5 x6	550	1,300	H	J. S.
18	Frisbie Valve-in-head	3	4¾x5	650	650	H	Opt.
18	Gaeth	2	5½x8	600	1,450	T	M.
18	Harris	2	5½x6½	500	1,750	H	M.
18	Hettinger	2	6½x8	400	1,500	L	M. & B.
18	Murray & Tregurtha	2	6½x8	425	1,867	L	Opt.
18	Nieland	3	6 x7	375	1,600	T	M. & B.
18	Palmer	2	6½x8	400	1,600	T	B. Dist.
18	Palmer	3	5 x6	600	1,000	T	J. S
18	Regal	2	6½x7	500	1,625	L	Opt.
18	Standard	2	6 x8	400	1,200	L	M. & B.
18	Wisconsin	4	3¼x5	1,000	490	L	M.
20	Acme	2	7¼x9	340	2,925	H	Opt.
20	Atlas Imperial	2	.....	350	3,280	H	M. & B.
20	Brennan	4	4 x5	1,000	600	L	B. & M.
20	Buffalo	4	3¾x5	800	710	L	J. S.
20	Doman	2	6 x7	800	1,000	T	J. S.
20	Dupont	2	5 x6½	700	1,500	H	M.
20	Evansville	4	5 x6	500	900	H	J. S.
20	Frisco Standard	2	7¼x9	320	2,885	H	Opt.
20	Guarantee	2	7 x7	...	...	..	J. S.
20	Hicks	2	7½x8½	400	3,000	H	M. & B.
20	Honest Clay	2	7½x7	400	1,850	H	J. S.
20	Hunter	4	3¾x4¼	800	550	L	M.
20	Kermath	4	4 x4	1,200	550	L	M.
20	Miller	4	3½x5	900	650	L	M.
20	Nieland	2	7½x9	300	2,000	L	M. & B.
20	Palmer	4	4½x6	600	1,150	T	J. S.
20	Ralaco	4	4 x6	600	1,375	H	J. S
20	Red Wing	4	3½x4½	700	670	L	M.

Four-Cycle Marine Motors For 1920—(Continued)

21 *to* 30 *Horsepower Four-Cycle Motors*

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	Location of Valves	Ignition
20	Regal	4	4½x5½	600	985	L	J. S.
20	Scripps	4	3¾x4	1,200	475	H	M.
20	Standard Kid	2	6¼x7½	...	1,200	..	Opt.
20	Twentieth Century	2	6½x8½	400	2,000	L	Opt
20	Union	2	7½x9	360	2,400	..	M. & B.
20	Vulcan	4	5¾x7	500	1,300	T	J. S.
20	Wright Reliable	2	6 x7½	450	1,500	H	B. I. Sr
21	Lathrop	3	5 x6½	500	...	T	J S
22	Buffalo	2	7 x9	350	2,100	L	J. S.
22	Elbridge (Stdzed.)	4	3½x5	1,000	450	H	M
22	Evansville	2	7 x9	350	1,800	H	J. S.
22	Fay & Bowen	4	3½x5	1,200	525	T	M.
22	Jacobson	4	3½x5	1,150	500	H	J. S.
22	Miller	4	4½x6	800	1,200	L	M
22	Vulcan	2	7½x8½	425	2,100	T	J. S.
22	Wisconsin	4	3¾x5	1,000	523	3	M.
22	Wolverine	3	6½x7	425	1,980	L	J. S.
24	Anderson	4	5 x6	500	1 600	T	M.
24	Automatic	4	5½x7	400	1,800	L	Opt
24	Buffalo	4	5 x6½	400	1,960	L	J. S.
24	Carl	4	6 x8	900	900	L	J. S.
24	Dunn	6	4¼x5	800	625	L	J. S.
24	Evansville	3	6 x6¼	500	1,300	H	J. S.
24	Fisherman	4	5 x6	550	1,500	H	J. S.
24	Mianus	3	6 x8	400	2,200	T	Opt.
24	Nieland	3	6½x7½	325	2,000	T	M. & B
24	Palmer	4	5 x6	600	1,250	T	J. S.
24	Red Wing	4	3¾x4¾	700	680	L	M.
24	Standard	4	5 x6½	450	1,600	L	M. & B.
24	Wisconsin	4	4 x5	1,000	556	L	M
24	Wood & Chute	3	6 x7	400	1,700	L	J. S.
25	Acme	2	6¼x7½	600	2,150	H	Opt.
25	Acme	3	6¼x7½	375	2,550	H	Opt.
25	Automatic	2	7½x9	350	2,625	L	Opt.
25	Frisco Standard	3	6¾x7	450	2,310	H	Opt.
25	Frisbie Valve-in-head	3	6 x6	600	1,050	H	Opt.
25	Guarantee	4	4½x5½	...	...	..	J. S.
25	Gray	4	3½x5	1,200	650	H	M.
25	Hettinger	2	7½x9	400	2,200	L	M. & B.
25	Honest Clay	4	5½x7	400	3,100	H	M. I. S.
25	Knox	2	7 x8	550	1,900	T	J. S.
25	Palmer	2	7½x10	400	3 000	T	B. & M.
25	Ralaco	2	7 x9	425	3,300	H	M. & B.
25	Reliable	2 opp.	7 x7	450	2,400	H	B. & M.
25	Sterling	4	3¾x5½	1,000	600	L	M.
25	Superior	4	4½x6	750	...	H	J. S.
25	Vulcan	3	6½x7¼	475	1,800	T	J. S.
26	Palmer	3	6¾x8	400	2,000	T	B. Dist.
27	Acme	2	8¼x10	320	3,975	H	Opt.
27	Gaeth	3	5½x8	600	1,800	T	M.
27	Standard	3	6 x8	400	1,800	L	M. & B
28	Carl	4	5 x6	700	800	L	J. S.
28	Lathrop	4	5 x6½	500	...	T	Opt.
28	Murray & Tregurtha	3	6½x8	450	2,216	L	Opt.
28	Speedway	4	4 x4½	1,200	560	L	M.
28	Trego Model 17	2	5 x8	800	1,500	H	B. & M
30	Atlas Imperial	2	.....	320	...	H	M. & B.
30	Automatic	4	5 x7	550	1,800	L	J. S.
30	Bridgeport	3	6½x7	400	1,800	L	M.
30	Buffalo	4	6 x7½	350	4,850	L	J. S.
30	Buffalo	4	4¾x5	800	929	L	J. S.
30	Doak	2	8 x10	350	4,900	H	M.
30	Foreman	4	5½x7	500	1,750	H	B. & M.
30	Frisbie Valve-in-head	4	4¾x5	800	725	H	Opt.
30	Frisco Standard	3	6½x8	360	3,285	H	Opt.
30	Harris	4	5½x6½	500	2,000	H	M.
30	Hicks	3	7½x8	450	3,150	H	M. & B.
30	Lathrop	3	5½x6½	700	...	T	J. S.
30	Miller	4	5¼x6	700	1,500	L	M.
30	Ralaco	4	5 x7	500	2,200	H	J. S.
30	Regal	4	5¼x6½	600	1,550	L	J. S.
30	Vulcan	4	6½x7¼	475	2,100	T	J. S
30	Wisconsin	4	4¾x5	1,000	612	T	M.
30	Wright Reliable	3	6 x7½	450	2,150	H	M. I. S.

32 *to* 40 *Horsepower Four-Cycle Motors*

32	Evansville	4	6 x6¼	500	1,400	H	J. S
32	Mianus	4	6 x8	400	2,750	T	Opt.
32	Regal	4	4½x5½	1,000	800	L	J. S.
32	Reliable	2 opp.	7½x8	450	2,550	H	B. & M.
32	Wolverine	3	7½x9	375	3,490	L	J. S.
32	Wood & Chute	4	6 x7	400	2,300	L	J. S.
33	Evansville	3	7 x9	350	2,400	H	J. S.
35	Acme	3	7¼x9	350	4,075	H	Opt.
35	Atlas Imperial	3	.....	350	4,100	H	M. & B.
35	Brennan	4	4½x5	1,000	750	L	B. & M.
35	Gray	4	4 x6	1,000	800	H	M.
35	Guarantee	4	5 x5½	...	...	..	J. S.
35	Hicks	3	7½x9	450	4,300	H	M. & B.
35	Honest Clay	4	6½x7	450	3,300	H	M. I. S.
35	Miller	4	5¼x7½	550	1,900	L	M.
35	Palmer	4	6½x8	400	2,400	T	B. Dist.
35	Palmer	3	7½x10	400	3,500	T	B. & M
35	Scripps	4	4¼x6	900	1,000	L	M.
35	Treiber	4	4¼x6	1,000	850	L	B. & M.
35	Union	3	7½x9	360	4,825	..	M. & B.
35	Vulcan	3	7½x8½	425	2,850	T	J. S.
36	Gaeth	4	5½x8	600	2,100	T	M.
36	Gray-Prior	4	4½x8	700	1,900	L	J. S.
36	Hettinger	4	6½x8	400	3,200	L	M. & B.
36	Red Wing	4	4 x5	1,000	610	L	M.
36	Regal	4	6½x7	500	2,700	L	J. S.
37	Automatic	3	7½x9	350	3,465	L	Opt.
37	Standard	4	6 x8	400	2,800	L	M. & B
38	J. V. B.	4	4¾x6	600	1,150	H	M. I. S.
40	Acme	3	6¼x7½	600	2,450	H	Opt.
40	Acme	4	6¼x7½	450	3,475	H	Opt.
40	Automatic	4	5½x7	550	1,850	L	J. S.
40	Brennan	4	4½x5	1,000	700	L	B. & M.
40	Brennan	4	5 x5	1,000	850	L	B. & M.
40	Cottrell Holmes	2	6 x8¼	800	900	L	M.
40	Doak	3	7¼x9	375	5,600	H	M.
40	Doman	4	4¾x6	900	1,150	T	M.
40	Dupont	4	5½x6	700	2,000	H	M.
40	Fay & Bowen	4	4¼x5½	1,400	900	L	M.
40	Frisbie Valve-in-head	4	6 x6	600	1,200	H	Opt.
40	Frisco Standard	3	8 x10	320	4,875	H	O.
40	Imperial	4	6½x8	450	2,600	L	J. S.
40	Kermath	4	4½x6¼	1,200	1,200	L	M.
40	Knox	4	5 x5½	825	950	T	B. & M.
40	Lathrop	4	5½x6½	700	...	T	J. S
40	Murray & Tregurtha	4	6½x8	450	2,916	L	Opt.
40	Niagara	4	4¾x5½	1,000	995	T	B. & M.
40	Red Wing	4	4½x5	1,000	650	L	M.
40	Vulcan	6	5¼x7	550	1,900	T	J. S.
40	Wisconsin	4	4¾x5½	1,000	787	T	M.
40	Wolverine	4	5½x7	800	1,500	L	J. S.
40	Wright Reliable	4	6 x7½	450	2,650	H	M. I. S.

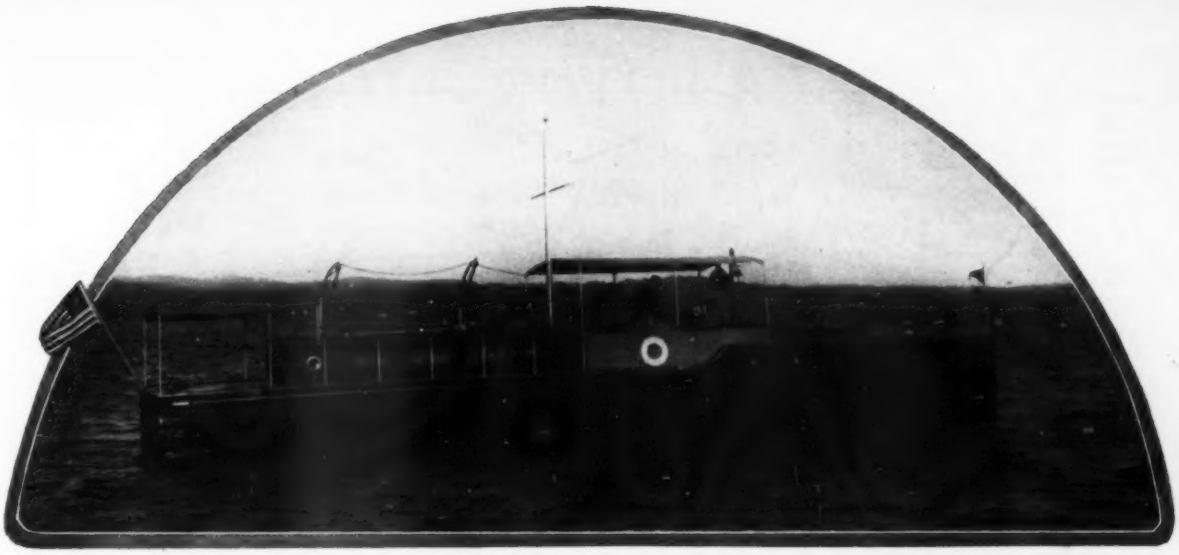
42 *to* 50 *Horsepower Four-Cycle Motors*

42	Wisconsin	6	4¼x5	1,000	826	T	M.
42	Wolverine	3	8½x9	375	3,660	L	J. S.
44	Evansville	4	7 x9	350	3,000	H	J. S.
44	Speedway	4	4½x5½	1,200	950	L	M.
45	Acme	3	8¼x10	325	5,050	H	Opt.
45	Atlas Imperial	3	.....	335	...	H	M. & B.
45	Automatic	6	5 x7	550	2,500	L	J. S.
45	Bridgeport	3	7½x9	375	3,200	L	M.
45	Buffalo	4	7 x9	350	3,655	L	J. S.
45	Doak	3	8 x10	350	5,500	H	M.
45	Fay & Bowen	4	5 x6¼	1,000	1,095	T	M.
45	Foreman	6	5½x7	500	2,350	H	B. & M.
45	Gray	4	4¾x6	1,000	1,100	H	M.
45	Ralaco	6	5 x7	500	2,700	H	J. S.
45	Reliable	2 opp.	9¼x10	350	5,500	H	B. & M.
45	Scripps	6	4¼x6	800	1,325	L	M.
45	Union	3	8¼x10½	320	6,450	..	M. & B.
45	Vulcan	4	7½x8½	425	3,400	T	J. S.
45	Wright Reliable	3	7½x9	350	4,600	H	M. I. S.
46	Wisconsin	4	5.1x5½	1,000	795	T	M.
50	Acme	4	7¼x9	375	5,160	H	Opt.
50	Atlas Imperial	4	.....	380	5,800	H	M. & B.
50	Anderson	4	7 x8½	450	2,900	T	M.
50	Automatic	4	7½x9	350	4,430	L	Opt.
50	Automatic	4	6½x8	500	3,000	L	J. S.
50	Brennan	6	4½x5	1,000	800	L	B. & M.
50	Doman	4	6 x7	800	1,800	T	J. S.
50	Fay & Bowen	4	4¾x5½	1,400	950	L	M.
50	Fay & Bowen	6	4½x5½	1,000	1,275	T	M.
50	Frisbie Valve-in-head	6	4¾x5	850	985	H	Opt.
50	Frisco Standard	3	8¾x10½	300	6,480	H	Opt.
50	Guarantee	4	6 x7	...	...	..	J. S.
50	Harris	6	5½x6½	500	2,260	H	M.
50	Hettinger	4	7½x9	400	4,500	L	M. & B.
50	Honest Clay	2	8½x10	350	3,900	H	M. I. S.
50	Honest Clay	4	7½x7	450	3,500	H	M. I. S.
50	Knox	4	7 x8	550	3,200	T	J. S.
50	Miller	4	6 x9	450	2,700	L	M.
50	Palmer	4	7½x10	400	4,200	T	B. & M.
50	Ralaco	4	7 x9	425	4,800	H	M. & B.
50	Regal	4	7½x9	450	4,600	L	J. S.
50	Scripps	4	4¼x6	1,500	825	L	M.
50	Standard	4	6½x8	550	4,000	L	J. S.
50	Twentieth Century	4	6½x8½	450	3,400	L	Opt.

50 *to* 75 *Horsepower Four-Cycle Motors*

54	Gaeth	6	5½x8	600	3,000	T	M.
54	Standard	6	6 x8	400	3,200	L	M. & B.
54	Wisconsin	4	5¼x7	800	1,290	T	M.
55	Acme	3	8¾x10½	300	6,680	H	Opt.
55	Acme	4	6¼x7½	600	3,350	H	Opt.
55	Atlas Imperial	3	.....	320	6,792	H	M. & B.
55	Sterling	4	5½x6¾	800	1,850	T	D. & M.
55	Wisconsin	6	4¾x5½	1,000	1,185	T	M.
56	Vulcan	3	8¾x10½	400	4,200	T	J. S.
57	Wisconsin	4	5½x7	800	1,290	T	M.
60	Automatic	6	5½x7	550	2,750	L	J. S.
60	Brennan	4	5½x6	1,000	975	L	B. & M.
60	Bridgeport	4	7½x9	375	4,000	L	M.
60	Buffalo	4	5½x7	900	1,730	L	J. S.
60	Doak	4	8 x10	350	6,400	H	M.
60	Dupont	6	5 x6½	700	2,650	H	M.
60	Guarantee	4	7 x7	...	...	..	J. S.
60	J. V. B.	4	4¾x6	1,200	1,150	H	M. I. S.
60	Murray & Tregurtha	6	6½x8	500	3,560	L	Opt.
60	Murray & Tregurtha	4	7½x10	375	4,667	L	Opt.
60	Palmer	6	6½x8	400	3,800	T	B. Dist.
60	Union	3	9 x11	320	7,400	..	M. & B.
60	Wolverine	3	9½x12	325	6,327	L	J. S.
60	Wright Reliable	6	7½x9	350	4,600	H	M. I. S.
62	Wisconsin	4	5¾x7	800	1,290	T	M.
65	Acme	4	8¼x10	350	6,675	H	Opt.
65	Acme	6	6¼x7½	500	4,825	H	Opt.
65	Atlas Imperial	4	.....	340	...	H	M. & B.
65	Elco	4	5 x6	1,000	650	T	M.
65	Frisco Standard	4	8 x10	360	6,475	H	Opt.
65	Wisconsin	6	5.1x5½	1,000	650	T	M.
66	Speedway	6	4½x5½	1,200	1,200	L	M.
70	Automatic	4	7½x9	500	4,800	L	J. S.
70	Buffalo	6	7 x9	350	4,850	L	J. S.
70	Harris	4	8 x10	350	5,850	H	M.
70	Standard	6	6½x8	550	6,000	L	J. S.
70	Vulcan	6	7½x8½	425	4,500	T	J. S.
75	Automatic	3	10 14	275	8,000	L	Opt.
75	Automatic	6	7½x9	350	6,500	L	Opt.
75	Automatic	6	6½x8	500	4,250	L	J. S.
75	Doak	3	9½x11	300	10,000	H	M.
75	Fay & Bowen	6	5 x6¼	1,100	1,480	T	M.
75	Frisbie Valve-in-head	6	6 x6	750	1,600	In head	Opt.
75	Knox	6	7 x8	550	4,500	T	J. S.
75	Scripps	..	4¼x6	1,500	1,100	L	M.
75	Speedway	4	5¾x7	1,000	1,850	L	B. & M.
75	Standard	4	8 x10	400	5,300	L	M. & B.
75	Sturtevant	4	4½x6	1,500	700	L	M.
75	Twentieth Century	6	6½x8½	475	4,500	L	Opt.
75	Vulcan	4	8¾x10½	375	5,500	T	J. S.

(*Continued on page* 134)



ORTALON

Recently Completed Express Cruiser from Designs by Tams, Lemoine & Crane

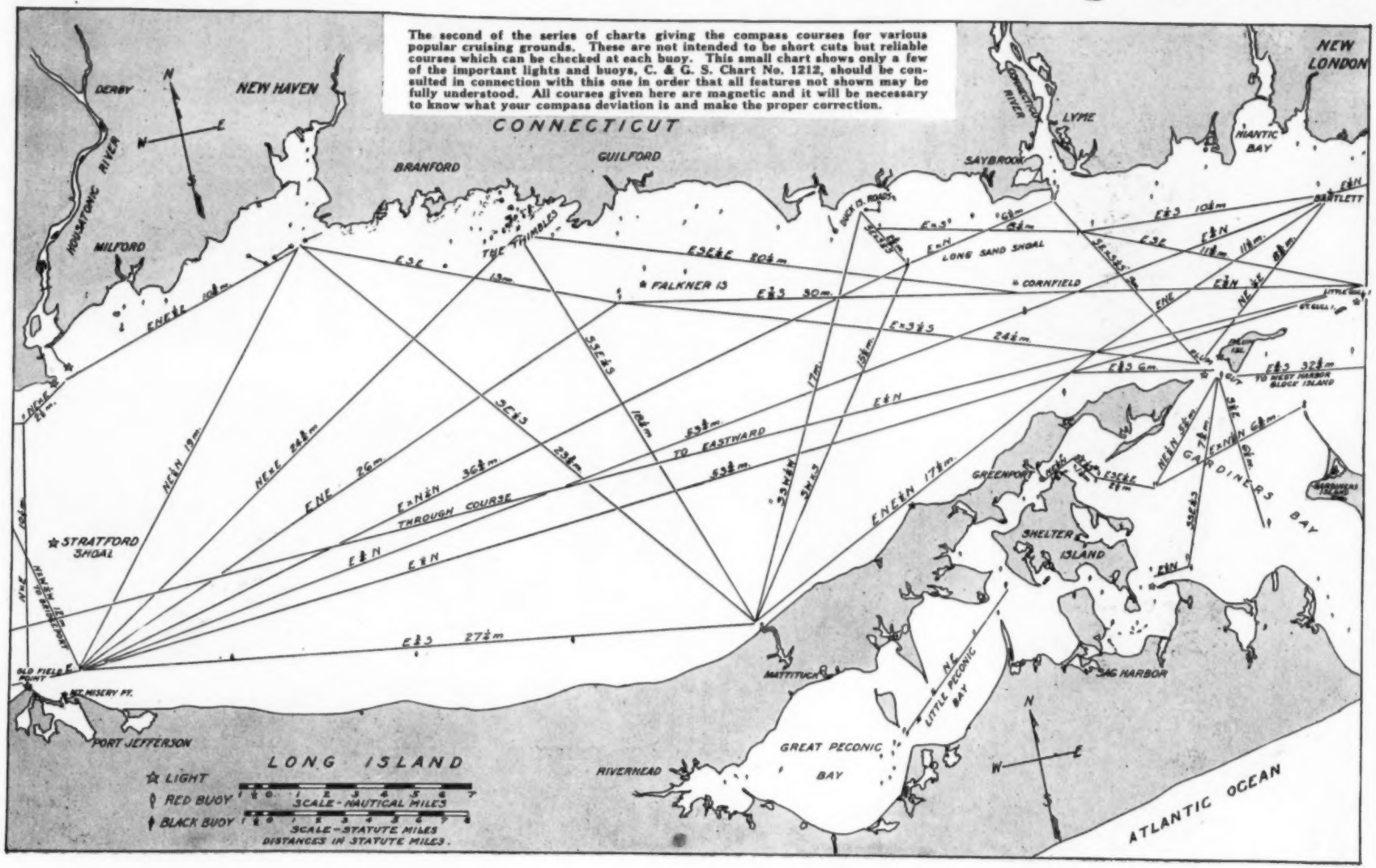
Built for W. A. Slater, of Washington, D. C., by Julius Peterson, of Nyack, N. Y. Ortalon has been delivered to her owner. She was designed to be a fast seaworthy and able cruiser to be operated with a minimum crew. Particular attention was paid to the ventilation to provide comfort while in Florida waters. Ortalon is 56 feet long by 11 feet beam, and is driven at better than 18 miles by an 8-cylinder Sterling engine.

Bridge and forward deck of Ortalon

Engine room, starting engine and Delco Electric Set

After saloon of Ortalon showing accomodations and locker space. She is finished in white enamel with mahogany trim throughout

No. 2. Useful Compass Courses on Eastern End of Long Island Sound


The second of the series of charts giving the compass courses for various popular cruising grounds. These are not intended to be short cuts but reliable courses which can be checked at each buoy. This small chart shows only a few of the important lights and buoys, C. & G. S. Chart No. 1212, should be consulted in connection with this one in order that all features not shown may be fully understood. All courses given here are magnetic and it will be necessary to know what your compass deviation is and make the proper correction.
CONNECTICUT
LONG ISLAND
DERBY
NEW HAVEN
HOUSATONIC RIVER
MILFORD
BRANFORD
GUILFORD
THE THIMBLES
FALKNER I.S.
STRATFORD SHOAL
OLD FIELD POINT
MT. MISERY PT.
PORT JEFFERSON
SAYBROOK
CONNECTICUT RIVER
LYME
NIANTIC BAY
NEW LONDON
BARTLETT
LONG SAND SHOAL
CORNFIELD
GREENPORT
SHELTER ISLAND
GARDINERS BAY
MATTITUCK
LITTLE PECONIC BAY
GREAT PECONIC BAY
SAG HARBOR
RIVERHEAD
ATLANTIC OCEAN
TO EASTWARD
THROUGH COURSE
TO WEST HARBOR BLOCK ISLAND
LIGHT
RED BUOY
BLACK BUOY
SCALE - NAUTICAL MILES
SCALE - STATUTE MILES
DISTANCES IN STATUTE MILES.

SMALL MOTOR BOATS

Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions Submitted for the February Prize Contest

1. State whether you think it would be advantageous to the sport and result in an increased motor boat ownership if a marine engine manufacturer sold his product on the instalment plan, as in other lines of business.
(Suggested by J. W. K., Jr., Jersey City, N. J.)

2. Describe and illustrate a satisfactory method of removing an exhaust pipe from the motor when, due to the processes of heat and rust, neither the pipe nor the nuts of the studs holding the flange respond to a wrench.
(Suggested by J. W. K. Jr., Jersey City, N. J.)

3. Explain your method of caring for the mooring during the winter. Do you raise it up or mark it and how do you do it?
(Suggested by W. B. M., Newburgh, N. Y.)

Rules for the Prize Contest

ANSWERS to the above questions for the February issue addressed to the Editor of MoToR BoatinG, 119 West 40th St., New York, must be (a) in our hands on or before January 12, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses.

The name will be withheld and initials used.

QUESTIONS for the next contest must reach us on or before January 12. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions below, any article or articles sold by an advertiser advertising in the current issue of MoToR BoatinG of which the advertised price does not exceed $25, or a credit of $25 on any article which sells for more than that amount. There are three prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer all.

For answers which we print that do not win a prize we pay space rates.

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of MoToR BoatinG, of which the advertised price does not exceed $5, or a credit of $5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us. The winners should be particular to specify from which advertisers they desire to have their prizes ordered.

What Should Be Done in the Fall to Be of Value in the Spring

Suggestions Made Advise Cleaning the Bottom and Protecting Exposed Woodwork with Paint or Varnish

Answers to the Following Question in the October Issue.

Describe in detail some particular thing or things that you have done when going out of commission in the fall that has proven of value when going into commission in the spring

Some Laying Up Suggestions

(The Prize Winning Answer)

IT is a mistake to lay up a boat for the winter in the same condition as she was on her last trip. In the springtime you are naturally in a hurry to have her overboard, and there are many items, which if given attention in the fall will make fitting out a lot easier, both in time and labor. Here are some of the items; and the reasons why they save time:

1. Clean off and scrub the underbody, for barnacles and grass comes off much easier when alive than when dead.

2. Varnish all bare wood, for the rains and snow of winter will stain the bare portions so that they can never be scraped down to the same color as the protected wood; and also to prevent the wood from becoming rotten.

3. Paint the underbody one coat of anti-fouling paint. One of the most trying conditions that a boat has to undergo, is the alternate wetting and drying the hull gets in the winter. One day the underbody will be covered with water, and the next day the air will dry it up. If there is any bare wood subjected to this action, it will not stand up very long. Even if the paint on the bottom looks in pretty good shape, you may be sure that the coat of paint that has been on all summer is worn pretty thin.

4. Repack all outside stuffing boxes. In the spring time hurry it is often the case that the boat gets over without new packing being put in the boxes. The result is that soon she will have to be hauled out again for the work to be done. Not only does this cost time, but money as well.

5. Clean the bilge of all oil and dirt. In any motor boat there is more or less oil and muck that gets down under the floor and lies in the bilge. If you do not clean this out when it is moist and fresh, you will find that much of it sticks fast in the spring and that the cabin will have a disagreeable odor all winter. A pail or two of hot water, a handful of washing soda, and a couple of scrubbing brushes will fix it right.

6. Coat all brass parts with a thick coat of vaseline and wrap in cloth. This will save many weary hours spent in the spring trying to rub off the corrosion of the winter months. Before coating with the grease you should polish the parts well.

7. Hang up all rope in a dry airy place, being sure that the coils are entirely separated. This will save the rotting of the rope due to the moisture getting in and not being able to get out. It will save replacing lines every year.

8. Coat the outside of the engine with a thick coat of vaseline. This will save scraping off rust in the spring.

9. Loosen all spark plugs and similar joints and oil the threads well with thick machine oil. In the spring you will not have to take a large wrench to loosen the plug, with the result of possibly breaking it off.

10. Pour lots of oil into the cylinders. This will save loosening a frozen piston. The job of loosening a piston quite often results in breaking the top.

11. If a four-cycle engine, turn over until all the valves are closed. This will relieve all valve springs from strain. You cannot expect a spring to work properly if it has been compressed all winter.

12. Drain all water from cylinders, manifolds, pumps, low points in the exhaust line, etc. This will save repairing a cracked pipe or cylinder in the spring.

13. Remove storage batteries to a place where there is no danger of their freezing, and fill the jars up with distilled water. This will save the life of the battery.

14. Close all openings in the hull that might leak rain or snow, but leave as many open as possible for ventilation. Lack of circulation will ruin a boat very quickly.

E. F. B., Paterson, N. J.

The Fourteen Points

THE writer has found from several years' experience that a few important tasks about the boat can be very easily and efficiently done immediately after hauling out during the middle of October or early in November, at which time the weather is ideal for such work. Doing these things in the fall will greatly facilitate an early launching in the spring with the outfit in prime condition which, after all, is the most important consideration for the motor boatman, both from the standpoint of recreation and economy.

The work, divided into two groups, follows in the respective order of importance:

1. Scrape bottom thoroughly to remove all barnacles and marine growth, which is a comparatively easy task if done at this time.
2. The bottom should be carefully examined for dry rots and leaks. These may be marked for repair. When dry apply a priming coat of paint to bottom.

3. If stored in the open, cover entire boat with waterproof canvas, erected in place over a framework so as to permit necessary ventilation.
4. Clean out bilges, especially making sure that the limber holes are free from accumulation of dirt, etc.
5. All rope should be thoroughly dried out and stored where it will remain so. The same also applies to the life preservers, and it is wise to sprinkle a small amount of flake camphor over them as a protection against moths.
6. Remove cushions, bedding, and other articles that can be readily and safely stored in locker or at home.
7. If you do not carry insurance while afloat, at least arrange for a policy covering fire risk for the winter period. Such rate is lower than regular marine insurance.

1. Run off all water in the engine, exhaust piping, and muffler to prevent freezing.
2. If the engine has removable heads they should be taken off and the carbon cleaned out and valves ground. The clutch and crankcase should be thoroughly cleaned with kerosene oil, and the entire motor should then be given a coating of fairly heavy oil. Take out spark plugs and priming cups and insert wooden plugs in their places.
3. Where the engine head is cast integral the carbon may be cleaned out with scrapers and a cup full of oil poured into each cylinder through the spark plug port.
4. Remove magneto and store in a dry place. If there is an electric lighting outfit the generator should have the same care as the magneto. The storage batteries should be placed in a charging station.
5. Examine engine bed, especially holding down bolts, and make note of any that require renewal.
6. Empty the fuel tank of all gasoline and clean out scale; also the pipe line. Here the carburetor should also get attention, especially the cork float should be examined, if of this type. If trouble had been experienced with the gas line clogging, a larger size pipe should be used.
7. Arrange to have any necessary machine work done now, as the shops are not as busy as in the spring.

At first the foregoing seems a rather formidable list, but practically all of the work can very easily be done in one week end, especially if one has a friend or two willing to help. When spring comes and your thoughts turn to motor boating, you will be amply repaid for the small amount of labor in the fall.

J. W. K., Jersey City, N. J.

Recommends Note Book

WHEN I remove my boat from the water I find it pays to do a number of things all of which help immensely in the spring when one is in a hurry to get in commission again.

The first thing to do after getting the boat out of the water and properly blocked up is to give the outside of the hull a thorough scrubbing with warm water and soap powder after which it is thoroughly rinsed.

The next step is to remove the cushions, bedding, etc., air them and store them in a dry place for the winter. If left in the boat they are sure to gather moisture and are likely to mildew and have an unpleasant odor by spring.

The next operation is to remove floor boards, etc., and give the bilge a thorough scrubbing, removing every particle of grease and dirt. All cleaning is done with little difficulty in the fall, as when left to the spring overhauling the dirt has become hardened and will require much more exertion to remove it.

When laying the boat up for the winter is the best time for draining the gasoline tank, blowing out the tubing, and cleaning the strainer. All polished steel parts should get a coat of grease to keep away the rust. If this work is all well gone over it is surprising how much easier it is in the spring to get in commission.

While dissembling if one keeps a note book handy and makes a note of each worn part that needs replacing and any special work that should be done and places an order for their extra parts at once much annoyance will be avoided at a later date. Just one thing more. If it is a cabin boat don't shut the cabin up air-tight but leave a chance for ventilation and your boat will be in much better condition in the spring than if you shut it tight.

D. E. W., Seneca Falls N. Y.

To Keep Your Motor Going with a Disabled Pump

Practical Methods of Improvising Circulating Water Systems in Case of Necessity

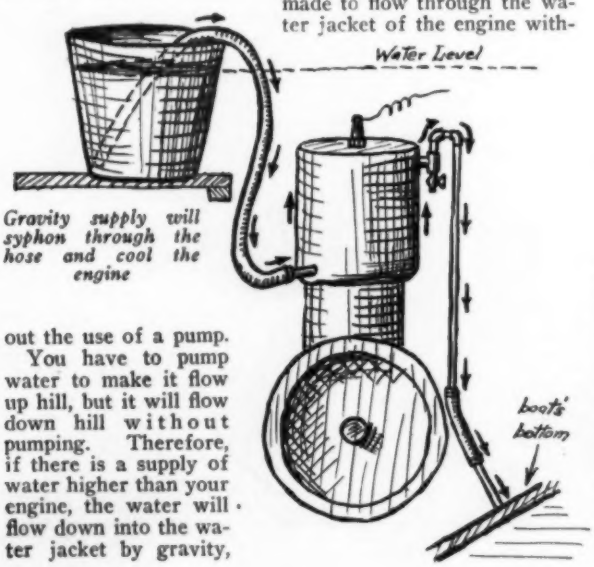
Answers to the Following Question in the October Issue

What procedure would you follow to continue running if the water circulating pump on your motor became disabled some distance off shore? Illustrate if possible.

Gravity as a Substitute for the Water Circulating Pump

(The Prize-Winning Answer.)

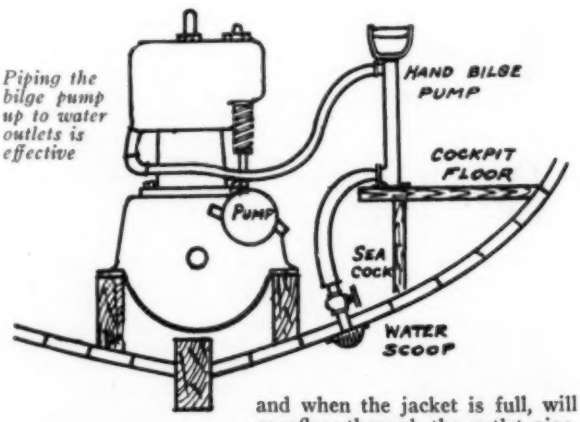
IF the water circulating pump on your motor should break down, it is not necessary to shut down your motor and wait for a tow. By making a few simple changes in your water circulating system, water can be made to flow through the water jacket of the engine without the use of a pump.



Gravity supply will syphon through the hose and cool the engine

You have to pump water to make it flow up hill, but it will flow down hill without pumping. Therefore, if there is a supply of water higher than your engine, the water will flow down into the water jacket by gravity, and when the jacket is full, will overflow through the outlet pipe. This flow will continue as long as the supply of water lasts.

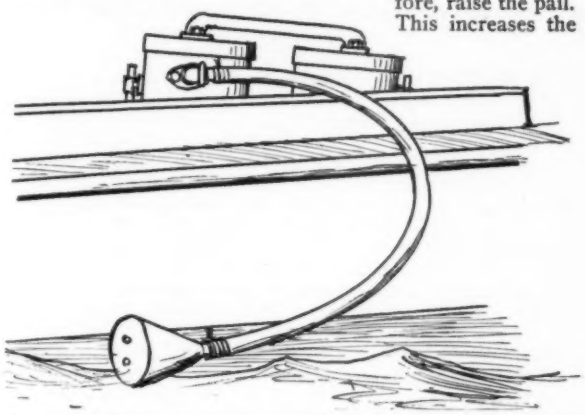
Piping the bilge pump up to water outlets is effective



The way in which the writer applied this system to his engine in a breakdown will be described. The disabled pump was disconnected at the discharge side from the pipe leading to the water jacket. A piece of tubing was slipped on the pipe (the rubber hose taken from the boat's bilge pump was pressed into service for this). An ordinary galvanized iron pail, which was part of the boat's equipment, was next filled with water and placed on the cockpit floor. This served as the water supply. The tubing was then led up to the pail and the end placed in the pail. As there was no way of draining water from the bottom of the pail, it was necessary to syphon it over the top edge. In order to get the syphon started the end of the tube was lowered

and water poured in until the tube was filled. The end of the tube was then covered with the thumb and quickly placed under water in the pail. Water then flowed from the pail through the water jacket of the engine and went overboard through the usual water outlet pipe, and the new cooling system was in operation.

Of course, the pail must be refilled with water every two or three minutes, depending upon the size of the engine, because the water is running from the pail through the jacket then overboard. If the engine runs hotter than before, raise the pail. This increases the head of water and will cause it to flow faster and keep the engine cooler. Likewise, if it runs too cold lower the pail. A position of the pail will be found where the engine will run at the correct temperature.



G. Y. L. believes the pressure of the water on a funnel is sufficient to supply the jacket

Besides the gravity system there is also the thermo-syphon system of water circulation, in which the water circulates on the principle that hot water rises. This system may be applied by bringing the water outlet back to the pail. The water level in this case must also be above the engine.

For use in an emergency, however, I am greatly in favor of the gravity system for the following reasons:

It is easier to apply to the engine. (Only one water connection must be changed.)

It more nearly duplicates former conditions. The water circulates very slowly in a thermo-syphon system, and when applied to an engine designed for a pump may result in the engine overheating.

The temperature of the engine can be regulated by changing the heights of the pail.

L. R. G., Huntington, L. I.

Bilge Pump Makes a Temporary Substitute

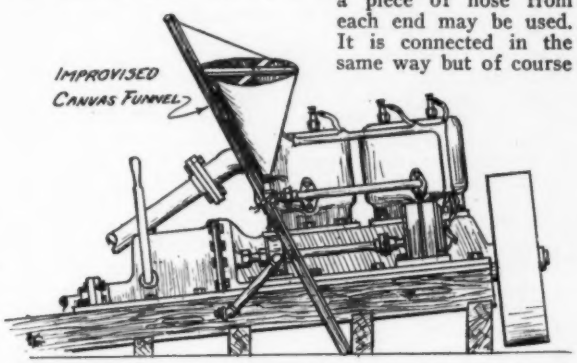
THE water circulating pump is an important part of the motor and if it does not function properly the motor will overheat. As a water pump may become disabled at any time, although it is not a frequent occurrence, means should be provided to keep the motor cooled so that the boat can reach port if this should occur, as it is quite impractical to think of running the motor without water cooling.

Very few boats have sufficient equipment on board to make any repairs involving the mending of broken parts except the simplest, so that fixing a disabled water pump in most cases would be out of the question. At least, it will be so assumed. When a pump fails to work, some other means of supplying cooling water to the motor must be provided or it cannot be operated. Most boats have this means at hand in the form of the bilge pump. Either a power pump or a hand pump, if of the right kind, will serve the purpose.

The first thing to do is to close the sea cock of the water intake so that the pump may be disconnected. Remove the hose connections from the intake side of the pump and from the exhaust side as well. If there is no hose in the waterline, then the pipe will have to be unscrewed. This, of course, cuts out the pump.

Having done this, the next step is to connect up the bilge pump in place of the regular circulating pump. If a small power pump is available, this will have sufficient hose to reach the proper points, both from its intake and its exhaust sides. The intake hose is run to the sea cock and connected there and the exhaust hose is run to the point where the water enters the water jackets of the motor. Thus connected, with the sea cock open, the motor can be run quite satisfactorily.

Not having a power pump, a hand pump of the type with a piece of hose from each end may be used. It is connected in the same way but of course involves the somewhat laborious task of steady pumping until port is reached. However, if there are enough men aboard to take turns every few minutes, this can be done and it beats waiting off shore hoping for a tow.



Suggestion by G. Y. L. to keep his motor cool in an emergency

No matter which method is used, there is the possibility of not furnishing as large a volume of water as the regular circulating pump, in which case the motor would not be cooled sufficiently. To counteract this possibility, the motor must be run slowly and an extra quantity of lubricating oil supplied even at the risk of carbonizing the cylinders, since plenty of oil assists the cooling.

There are two types of power pumps and two types of hand pumps that are satisfactory for this emergency use. One type of power pump works by friction against the rim of the flywheel and the other is operated by an eccentric on the propeller shaft. There is a rotary hand pump and also one of the plunger type that has a hose running from the lower end of the intake. Either one of these can be used. The hand pump has one advantage over the power-driven pump for this purpose in that the volume of water delivered is not dependent on the speed of the motor.

By referring to the accompanying sketch, the arrangement will be readily understood and it will generally be found a very simple matter to take off the hose or other connections on most motors so that this temporary arrangement can be connected up.

A. L. M., New York, N. Y.

Getting Home Without the Cooling Water Pump

THAT resourceful type of mariner who hasn't been towed home yet, and doesn't expect to be as long as there is a wrench and a rusty nail aboard his ship, will first see if there is not some way to screw or splice or rivet a broken cooling water pump together, so that it will function long enough to get home.

If, however, there is no way in which it may be repaired, he will remove it in such a way that there is a pipe outlet for whatever water supply he may be able to improvise for it.

As he searches for a way of persuading water to flow through the engine his thoughts will probably revert to the old brass bilge pump, that contemptible contraption with which, by infinite labor, he coaxes the rains and showers of heaven from his boat into the bay. Just wires the free end of the rubber hose to the cooling water inlet on

(*Continued on page 70*)

Runabout Seating Arrangements

General Similarity of Various Plans Is Only Natural as There Is a Limit to the Arrangements Possible in a Boat as Small as this One Is Required to Be.

Answer to the following question in the October Issue

Give your opinion of and illustrate the most desirable arrangement for a runabout approximately 25 feet long

Cockpit Space Left Open for Chairs

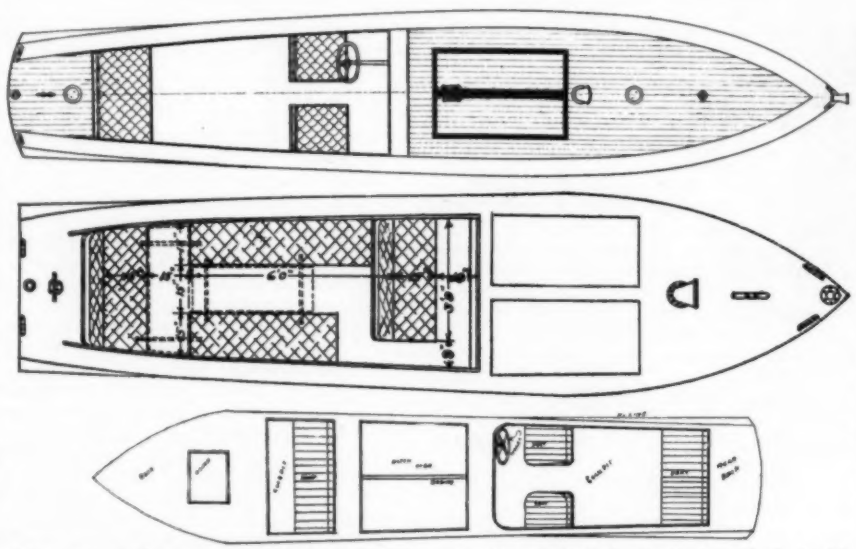
(The Prize Winning Answer)

THERE are not more than four or five ways in which you can arrange the seating accommodations on a 25-foot runabout, and the one shown in the accompanying plan is probably as good as any; and better than the most. In the first place there has been no attempt made to seat a great number of people on permanent seats. A good sized space has been left between the backs on the forward seats and the after seat. This space can be filled with chairs in case a large party is to be carried, but ordinarily not over five persons are carried on a boat of this type. The after seat will accommodate three persons, and when running at her best, the boat should have some weight aft, for all boats of this type are somewhat down by the head at rest, and require live ballast well aft in order to bring them down to the proper lines. Under the after seat there is a good sized locker reached from under the cushion; and the space under the after deck can be reached by removing the lazyback of the seats.

The forward seat is cut in half and arranged in a pair. Each of these seats is wide and comfortable for one person. The aisle between the two, permits one to walk fore and aft in the cockpit without climbing over a thwartship seat. This latter is particularly hard for women, and in the case of a high-speed boat is really dangerous for all hands. Under each of these seats can be arranged lockers with either removable lids, or better yet, drawers pulling out into the cockpit. If one of these lockers is fitted up as an ice-box, and the other to hold a small stove of the alcohol or kerosene types, one can cruise in a serious way on a boat of this type. In the case of the man who wants to use the boat as a cruiser, he should leave the locker out under the after seat. This will permit the laying of air mattresses on the cockpit floor. A spray hood or automobile top with glass windshield and side curtains will enclose everything snuggly. Storage spaces for the duffle will be found both under the forward and after decks.

Nothing has been said thus far concerning the location of the engine and gasoline tanks. The tanks can be located under the forward deck and used with gravity feed or they can be located under the after deck in which case pressure feed would probably be necessary. The engine following conventional practice must needs be placed under the forward deck.

C. A. N., New York, N. Y.



Plans for seating arrangement for runabouts suggested by C.A.N., G. Y. L. and G. S. M. respectively

The Best Seating Arrangement for a Runabout

ABOUT the best arrangement of seats in a runabout approximately 25 feet long is that shown in the accompanying sketch. It is a combination of side seats, a survival of the old family launch days which many of us still regard with a lingering affection, and cross seats with their comfortable lazybacks. It gives the largest practicable seating capacity and free accessibility from front to rear. It affords an opportunity for owner and guests to pair off as they choose. And the helmsman who likes girls does not have to sit alone. Seats and lazybacks are upholstered with kapoc life preserver cushions.

But there is a kink about this arrangement which will appeal to the boatman who does not own a cruiser, and yet who likes to go off on week end fishing trips or cruises. The backs of the cross seats are removable and are of such size that they just fit into the space between the stern seat and the cross seats, and between the two cross seats, where they are supported by wooden bars sliding in brass loops on the underside of the seats, as shown by the dotted lines in the sketch. The cushions to the backs will, of course, cover them nicely in their new position, and the whole makes a bunk from side to side of the boat, on which, when the spray hoods or the auto top with side curtains are up, the skipper can spend a very comfortable night.

G. Y. L., Brooklyn, N. Y.

Separate Cockpit for the Operator

THE up-to-date runabout is becoming more and more a combination of speed, beauty, and comfort. Each of these three elements is found, to some extent, in all the recently built boats.

In the first place, a good runabout must have a moderately powerful, high-speed engine, well placed in the hull. About the best location for the motor is approximately midway between bow and stern. No engine should be allowed to mar the looks of the boat; so we decided that it be placed in a separate, covered compartment. Now that we have our engine placed, and have decided on a deck over the forward part of the boat, let us turn to the seating arrangement.

The 25-foot runabout, is the ideal size for a family of

(*Continued on page 70*)

Toppan Boats for 1920

A Full Line of Stock Boats Being Built at Medford, Mass., Will Include Every Possible Type from Hydroplane to Cruisers

AMONG the complete assortment of stock boats carried by the Toppan Boat Mfg. Co., Dept. M, of Medford, Mass., can be found a suitable type to suit the most varied taste. For the man who wants speed, is made a 16x4½-foot hydroplane. This is the smallest hydroplane made, strong, light, screw-fastened, and cedar planked. When equipped with a 12 h.p. Universal motor a speed of upwards of fifteen miles is attained.

The larger motor launches up to 30x7 feet called Government models, are durable rough water boats designed with fine lines for speed and a flaring bow for freedom from spray. They will carry a heavy load of passengers with ease and comfort

Sailing dories equipped with auxiliary power are popular

Toppan Runabouts called Government Models made up to 30 ft. long equipped with suitable power plant

and can be had in various sizes equipped with suitable power plants for each.

V-Bottom supporters can be satisfied also. A 21-foot runabout equipped with a Universal motor and a speed of 10 miles being provided for these enthusiasts.

The fisherman is particularly well cared for. Toppan lap-streak dories are provided for his wants. These famous boats are ready in a multitude of sizes. The complete variety is almost too numerous to mention them all. They began with small towing skiffs from 11 to 16 feet long, advancing to a sturdier skiff 15 feet long designed particularly for use with an outboard motor, to carry six persons. Then come sailing dories from 14 to 21 feet, some of which can be equipped with motors as auxiliaries; among these is found the famous Swampscott three-in-one dory 18 feet long, supplied with a 3 h.p. Palmer motor. Finally power dories in both smooth and lap-streak construction from 16 feet to 22 feet long supplied with power according to their size. Palmer, Kermath, and Universal motors being the favorite choice.

However, motors of any make can be supplied should the purchaser have decided preferences.

In between the above sizes and as a matter of fact either larger or smaller as well, there seems to be no gap in the range of lengths of craft which are carried in stock at all times by the Toppan Boat Co. This concern has been in business building stock boats for many years and have a reputation surpassed by none. As a result their workmanship is of the best and their products reliable in every particular.

Lap-streak fishing dory with motor enclosed

Toppan Sportsman 16 ft. long equipped with 3 h.p. Palmer

Builders of Stock Boats for 1920

An Alphabetical List of Manufacturers of Stock Boats Whose Products Are Listed Under Their Trade Name Below

Name of Boat	Manufacturer and Address
Albany	Albany Boat Corp., Watervliet, N. Y.
Belle Isle	Belle Isle Boat & Eng. Co., Detroit, Mich.
Cuthbert	A. G. Cuthbert Co., Sandusky, O.
Disappearing Propeller	Disappearing Propeller Boat Co., Ltd., Toronto, Can.
Elco	The Elco Wks., Bayonne, N. J.
Evinrude	Evinrude Motor Co., Milwaukee, Wis.
Fay & Bowen	Fay & Bowen Eng. Co., Geneva, N. Y.
Great Lakes	Great Lakes Boat Bldg. Corp., Milwaukee, Wis.
Hacker	Hacker Boat Co., Inc., Detroit, Mich.; Mt. Clemens Mich.
Hyde	Hyde Boat & Eng. Co., 185 Greenwich St., New York N. Y.
International	International Shipbldg. & Marine Eng. Corp., Nyack N. Y.
Moxley	W. J. Moxley & Son, Cos Cob, Conn.
Mullins	Mullins Body Corp., Salem, O.
Niagara	Niagara Motor Boat Co., North Tonawanda, N. Y.
Peterborough	Peterborough Canoe Co., Peterborough, Ont.
Racine	Racine Boat Co., Racine, Wis.
Ramaley	Ramaley Boat Co., Wayzata, Minn.
Reliance	Reliance Motor Boat Co., 207th St. West, Harlem River New York, N. Y.
Richardson	Richardson Boat Co., No. Tonawanda, N. Y.
Rochester	Rochester Boat Wks., Inc., Rochester, N. Y.
Seabright	Seabright Dory Wks., Long Branch, N. J.
Speedway	Consolidated Shipbldg. Corp., Morris Heights, New York, N. Y.
Toppan	Toppan Boat Mfg. Co., Medford, Mass.

Stock Boats for 1920

An Index of All Stock Boats Regularly Carried By Various Builders Listed According to Their Size

Lgh Ft.	Manufacturer	Type	Beam	Draft Ins.	Horse Power	RPM	Propelr. Ins.	Speed m p h
10	Hyde	Tender	50″	8	4	800	12	9
12	Hyde	Tender	50″	10	6	800	12	9
15	Racine	Launch	4′-4″	12	3-10	.....	.....	8-14
16	Moxley	Launch	4′-6″	24	2½	600	12	7
16	Moxley	Launch	4′-6″	25	5	600	14	8
16	Toppan	Hydroplane	4½′	.....	12	.....	.....	15
16	Toppan	Runabout	.....	.....	3	.....	.....	.....
16	Peterborough	Tunnel	4′-2″	4	3	800	12	8
16	Mullins	Launch	4′	12	3	.....	.....	9
16	Mullins	Launch	4′	12	8	.....	.....	11
16	Mullins	Hydroplane	4′-4″	17	25	.....	.....	28
16	Mullins	Tunnel	4′-2″	5	3-12	.....	.....	6½-8½
16	Cuthbert	Runabout	4′-6″	18	6	900	13	9
16½	Disappearing	Proplr. Launch	4′-11″	.....	2½	.....	.....	9
16½	Disappearing	Proplr. Launch	4′-1″	.....	2½	.....	.....	9½
17	Mullins	Launch	4′-2″	15	3-12	.....	.....	7-10
18	Speedway	Tender	5′	18	28	.....	.....	15
18	Toppan	Dory	.....	.....	3	.....	.....	7
18	Toppan	Runabout	.....	.....	3	.....	.....	7
18	Peterborough	Runabout	4′-4″	18	6	850	14	11
18	Mullins	Launch	4′-9″	15	8-12	.....	.....	8-11
18	Racine	Shallow Draft	5′	9	6-12	.....	.....	7-11
18	Belle Isle	Launch	4′-6″	18	2	600	10	8
18	Richardson	V-Bot. Runbt.	.....	.....	.....	.....	.....	.....
18½	Disappearing	Proplr. Launch	4′-8″	.....	2½	.....	.....	9
19	Speedway	Tender	5′-18″	28	.....	.....	.....	15
19	Racine	Runabout	4′-6″	14	10-25	.....	.....	13-21
19	Racine	Runabout	4′-6″	16	5-12	.....	.....	8-14
20	Speedway	Tender	5′-6″	20	28	.....	.....	15
20	Toppan	Dory	5′-6″	.....	12	.....	.....	9
20	Moxley	Launch	5′-8″	26	5	600	14	7½
20	Peterborough	V-Bottom	5′	22	20	900	16	20
20	Mullins	Runabout	5′	20	8-12	.....	.....	10-11
20	Belle Isle	Launch	5′-8″	20	10	1000	13	10
21	Cuthbert	Runabout	5′-4″	22	24	1,100	16	12
21	Mullins	Runabout	4′-6″	20	12	.....	.....	10
21	Speedway	Tender	5′-6″	20	28	.....	.....	16
21	Toppan	V-Bottom	5′	.....	12	.....	.....	10
21	Seabright	Dory	6′	20	11	800	18x20	9
21	Racine	Shallow Draft	5′-4″	10	6-12	.....	.....	7-11
22	Belle Isle	Launch	6′	20	12	900	14	12
22	Mullins	Runabout	5′-6″	22	12-20	.....	.....	12-14
22	Ramaley	V-Bot. Runbt.	6′	18	60	1,800	16x16	30
22	Toppan	Dory	6′	.....	12	.....	.....	12-14
23	Speedway	Coupe Tender	5′-8″	24	.....	.....	.....	14
23	Racine	Runabout	4′-10″	14	15-50	.....	.....	12-28
24	Fay & Bowen	Runabout	5′	20	22	1,080	16x20	16
25	Racine	Standing Top	5′-6″	22	15-35	.....	.....	10-18
25	Belle Isle	V-Bot. Runbt.	6′-6″	22	25	1,200	15x20	16
25	Ramaley	V-Bot. Runbt.	5′-6″	18	60	1,800	16x16	30
25	Richardson	V-Bot. Runbt.	5′-8″	.....	.....	.....	.....	.....
25	Richardson	V-Bot. Cruiser	5′-8″	.....	.....	.....	.....	.....
25	Speedway	Runabout	5′-6″	22	28	.....	.....	15
25	Speedway	Coupe Tender	6′-3″	24	.....	.....	.....	15
25	Seabright	Dory	7′	20	16	800	20x22	9
25	Moxley	Launch	6′	28	10	550	20	9
25	Moxley	Launch	6′	28	12	600	20	10
25	Peterborough	Runabout	5′-6″	24	30	900	16	16
25	Mullins	Runabout	5′	27	20-40	.....	.....	14-20
25	Racine	Runabout	5′-2″	15	17-85	.....	.....	20-33
26	Mullins	Runabout	6′	24	20-40	.....	.....	14-20
26	Fay & Bowen	Runabout	5′	22	22	1,000	16x20	14
26	Reliance	Runabout	5′-2″	24	100	1,400	18	36
26	Hacker	Runabout	6′-2″	27	50	1,200	.....	25
26	Cuthbert	Runabout	6′	24	30	1,050	18	14
26	Cuthbert	Cruiser	8′	24	24	1,000	20	12
26	Albany	Runabout	6′	25	50	1,500	18x20	23
26½	Toppan	Runabout	6′	.....	20	.....	.....	.....
27	Fay & Bowen	Runabout	5′-3″	24	33	1,400	16x20	20
28	Ramaley	V-Bot. Runbt.	6′	20	60	1,550	16x18	28
28	Speedway	Coupe Tender	6′-3″	27	.....	.....	.....	16
28	Fay & Bowen	Runabout	5′-6″	24	35	1,000	.....	18
28	Belle Isle	V-Bot. Runbt.	7′-3″	24	100	1,400	18x29	30
28	Niagara	Runabout	5′-6″	24	35	1,000	.....	18
29'3	Hacker	Runabout	6′-2″	27	175	1,600	.....	40
30	Elco	Runabout	.....	.....	65	.....	2	22
30	Speedway	Runabout	6′	26	44	.....	.....	19
30	Speedway	Tender	6′	24	30	.....	.....	14
30	Speedway	Coupe Tender	6′-9″	27	.....	.....	.....	17
30	Toppan	Runabout	7′	.....	25	.....	.....	.....
30	Ramaley	V-Bot. Runbt.	7′	22	100	1,550	18x22	30
30	Reliance	Runabout	6′	28	150	1,400	19	36
30	Fay & Bowen	Runabout	5′-6″	24	50	1,000	20x24	20
30	Racine	Runabout	5′-8″	22	25-150	.....	.....	20-35
30	Racine	Runabout	6′-4″	28	35-125	.....	.....	15-28
30	Racine	Standing Top	7′	24	20-45	.....	.....	10-18
30	Albany	Runabout	6′-4″	27	90	1,500	18x27	29
31	Great Lakes	Exp. Cruiser	8′-3″	.....	60	.....	.....	18
31	Racine	V-Bot. Cruiser	7′-6″	26	20-60	.....	.....	.....
32	Speedway	Runabout	6′	30	66	.....	.....	22
32	Speedway	Coupe Tender	7′	30	.....	.....	.....	20
32	Elco	Cruisette	.....	.....	.....	.....	.....	10
32	Fay & Bowen	Runabout	6′	24	75	1,200	.....	28
32	Cuthbert	Runabout	7′	24	60	1,350	22	20
32	Cuthbert	R. D. Cruiser	8′-6″	28	40	1,000	24	15
32	International	Cruiser	9′	36	20	1,200	.....	10
32	Niagara	Runabout	6′	24	75	1,200	.....	28
35	Ramaley	V-Bot. Runbt.	7′	24	150	1,550	18x28	32
35	Richardson	R. D. Cruiser	9′	.....	.....	.....	.....	.....
35	Speedway	Runabout	6′-6″	30	150	.....	.....	27
35	Speedway	Coupe Tender	7′-3″	30	.....	.....	.....	20
35	Speedway	Coupe Tender	7′-3″	30	.....	.....	.....	25
35	Sea Bright	Dory Cruiser	10′	24	30	800	20x24	10
35	Racine	Runabout	6′	15	75-200	.....	.....	20-38
35	Albany	Runabout	6′-6″	28	125-200	1,500	20x30	33-40
36	Great Lakes	Exp. Cruiser	9′	.....	100	.....	.....	18
36	Elco	Runabout	.....	.....	100	.....	.....	26
36	Albany	Cruiser	10′	36	75	1,200	20x24	15
39'6	Racine	Cruiser	9′-6″	30	40	.....	.....	12
40	Rochester	Cruiser	9′-6″	33	100	.....	.....	15
40	Speedway	Day Cruiser	8′-9″	33	150	.....	.....	19½
42	Cuthbert	R. D. Cruiser	9′-6″	32	50	1,100	26	13
42	Cuthbert	Twin Cabin	9′-6″	32	85	1,100	26	16
42	Richardson	V-Bot. Cruiser	9′-6″	.....	.....	.....	.....	.....
43	Great Lakes	Exp. Cruiser	9′	.....	150	.....	.....	20
45	Rochester	Cruiser	9′-6″	33	150	.....	.....	18
45	Richardson	Cruiser	10′-3″	.....	.....	.....	.....	.....
50	Elco	Cruiser	.....	.....	80	.....	.....	13
50	Albany	Cruiser	11′	36	200	1,400	22x22	22
52	Great Lakes	Exp. Cruiser	11′	.....	200-300	.....	.....	22
52	Speedway	Cruiser	11′-4″	36	75	.....	.....	14
57	Albany	Cruiser	11′	36	200	1,400	22x22	22
65	Racine	Cruiser	13′	3′-9″	75-150	.....	.....	.....
80	Elco	M. L. Yacht	.....	.....	440	.....	.....	22

Starting Correctly to Build

Beveling the Frames Preparatory to Taking Spilings, and the Fitting of the Deck Beams

By William Atkin

This article is the seventh of a series by Mr. Atkin which will take up the complete building of a boat, step by step, in the proper order in which the construction work should be done.

A brief resume of previous articles is given for ready reference:

I—June 1919—The Laying Down of Lines—and the Proper Way to Interpret the Data on the Plans.

II—July 1919—Shaping the Stem, Keel, and Deadwood.

III—August 1919—Constructing the Deadwood and Boring the Shaftlog.

IV—September 1919—Various Methods of Stern Construction, Setting Up the Keel, and Bending of Frames.

V—October 1919—Steaming Woods, Fitting the Floors, Frame Fastenings, and Cutting the Limbers.

VI—November 1919—Methods of Planking and Caulking the Hull.

By following this series any amateur will be able to build his own boat.—Editor.

PRELIMINARY to actually fitting any of the planking it is always necessary to fair up the frames, for despite all the care one may bestow upon the shaping of the forms and upon the bending of the frames small inequalities will persist in showing just as mistakes will happen in the best regulated families.

It is also true, and despite the fact that the frames have been bent outside of the bending battens, that the bevels of the frames, especially those well forward, will not be perfect; this latter item then, must be attended to in the manner shown in Fig. 49. By bending a rather stiff light batten of perhaps 6-foot length both in a fore and aft and in a diagonal direction over the frames the inequalities will be made apparent. The high spots must be trimmed off; the low spots shimmed up. Shimming up frames is not good practice, however, but is permissible here and there. If a shim is required it should be of hard wood and laid against a frame as shown in Fig. 50.

It is the general custom among boat builders to apply first the plank which follows the sheer: this one is called the sheer streak.

Because of the everchanging shape of the boat's sections as the ends of the craft are approached practically every plank is of a different shape and because the girth of each section is different in length each plank varies in width—usually widest at their centers of length and narrowest at their ends.

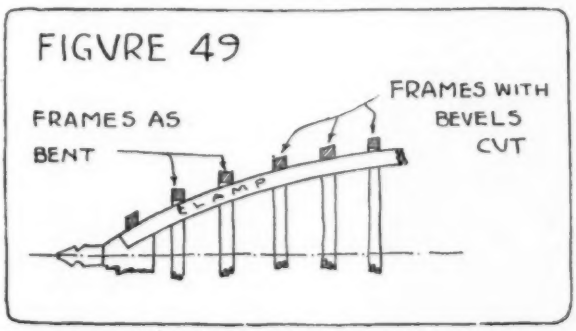
Should one lay a straight board along the sheer, it, if clamped tightly against the frames, will turn up where the sections flare out and turn down where the sections tumble home.

It is therefore necessary, in order for a plank to fit against the frames and also to follow the sheer, for it to be otherwise than straight. I perhaps had better say here that it is almost an impossibility to spring a 4- or 5-inch plank edgeways, except for a short distance.

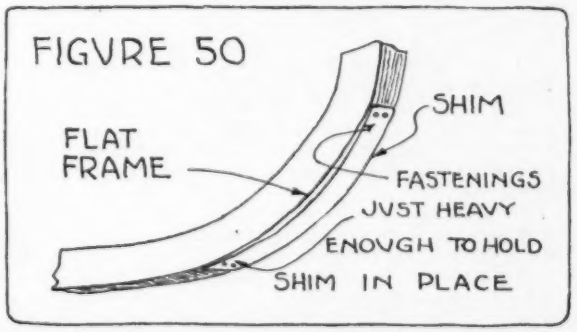
Therefore it becomes necessary to cut each plank to a shape which will naturally fit against the frames without forcing it in any manner.

To obtain the proper shape of the sheer streak is not a difficult process,—and when this is learned the rest of the planking can be shaped without trouble—it is really only a case of development.

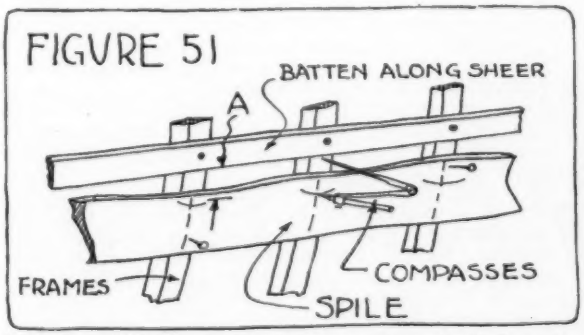
Boat builders call the operation of obtaining the shape of the sheer streak, or any other streak which is obtained direct from the set up frame, taking a spiling, which means measuring the intervals which show the distances from a curved beam or plate to the edge of the straight template.



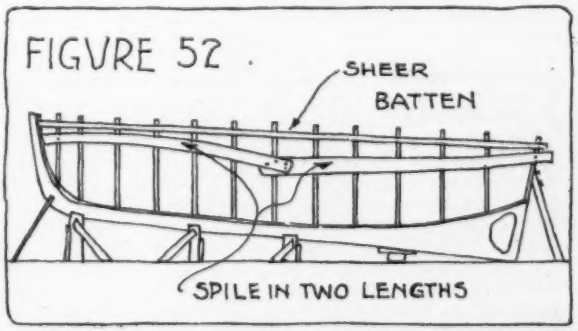
Bevels of frames, particularly those forward, will not be perfect and will require trimming



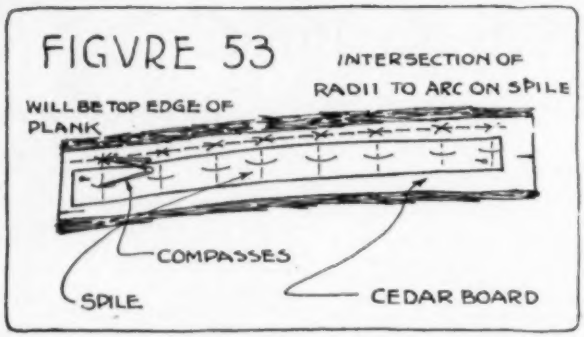
Skimming up frames is not good practice but is necessary at times to preserve fair lines



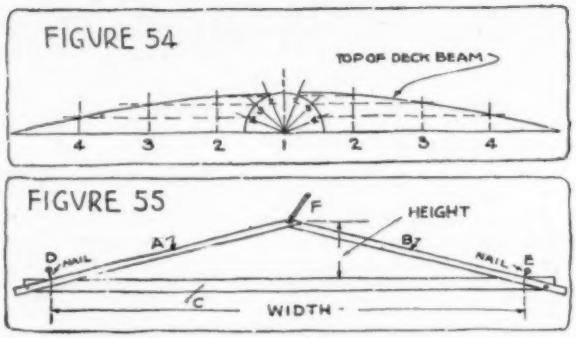
Taking a spiling from a sheer batten to shape the sheer streak properly



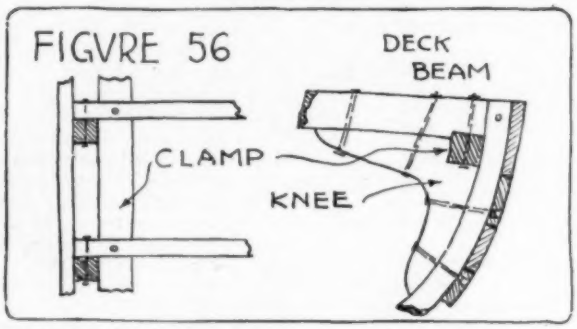
It is not necessary for a spile to be in one piece, two may be better



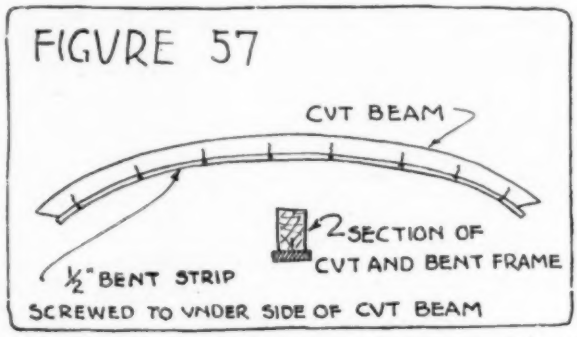
Method of transferring the sheer line to the board selected for the sheer streak



Two simple methods for laying out the crown for deck beams and carlins



Fastening of deck beams to frames. Use of natural knee makes a good job



Combination of a cut and bent beam adds to the strength and is easy to do

The template is correctly called a spile. However, as boat builders are not always correct in the use of English words and as persistence in the use of any word soon makes the word common, the spile is called a spiling board or a staff.

As the sheer is a known quantity and as it has been marked on each of the forms it is a simple matter enough to fasten a temporary batten from end to end of the boat, and above these markings as shown in Fig. 51. A line drawn along the under side of this batten and across each frame marks the correct shape of the sheer to which the top edge of the sheer or top streak must fit.

Use for a spile a light plank which may be easily curved fore and aft around the frames. One must be careful though, not to spring the spile edgeways else the spiling will be at fault. It is not necessary that this extend in one piece from end to end of the boat, in fact better results will accrue if two lengths are used connected amidships as shown in Fig. 52.

Practically all boats over 18 feet in length are planked with butted planks for little advantage is gained through using single length streaks. Thus a spiling may be taken on a comparatively short spile for each length of plank.

Referring again to Fig. 51. A pair of compasses are shown actively engaged in the pursuit of setting off a distance which is slightly greater than the widest interval between the top of the spile and the under side of the sheer batten ("A" in the figure). With these compasses set at this distance describe an arc on the spile using the center of each frame as a base. Also draw a line across the spile to represent the center of each frame. With this completed for the length of the spile draw out the few fastenings which hold it and prepare to transfer the spilings to the board which has been selected to cut the sheer streak from.

Fig. 53 shows how the spile is tacked to an unfinished board and how the compasses set at the same radius as originally set in taking the spiling from the sheer are used to lay out the line of the sheer on the board. A batten laid through the intersections of the crossed arcs will outline the shape of the top edge of the sheer streak.

The shape of the lower edge is found by laying off the widths of the sheer streak at each frame from the spiled edge, and of course drawing a fair line through them.

To look well upon the completion of the boat the widest part of each plank should be somewhere amidships. Also it is good practice to so lay out the widths of all the planking so that those at the bow are wider than those at the stern. A good proportion for these widths is represented wide amidship, 3½ inches wide at the bow, and 2¾ inches by a top streak for a 20-foot boat which should be 5 inches wide at the stern.

The intermediate widths are found by tacking a batten fore and aft over the frames so that its top edge will describe a fair sweep from stem to stern the while passing through the three points already determined as the correct widths for the sheer streak amidships and at both ends. There is a geometrical way for obtaining the widths of these distances which I shall take up later.

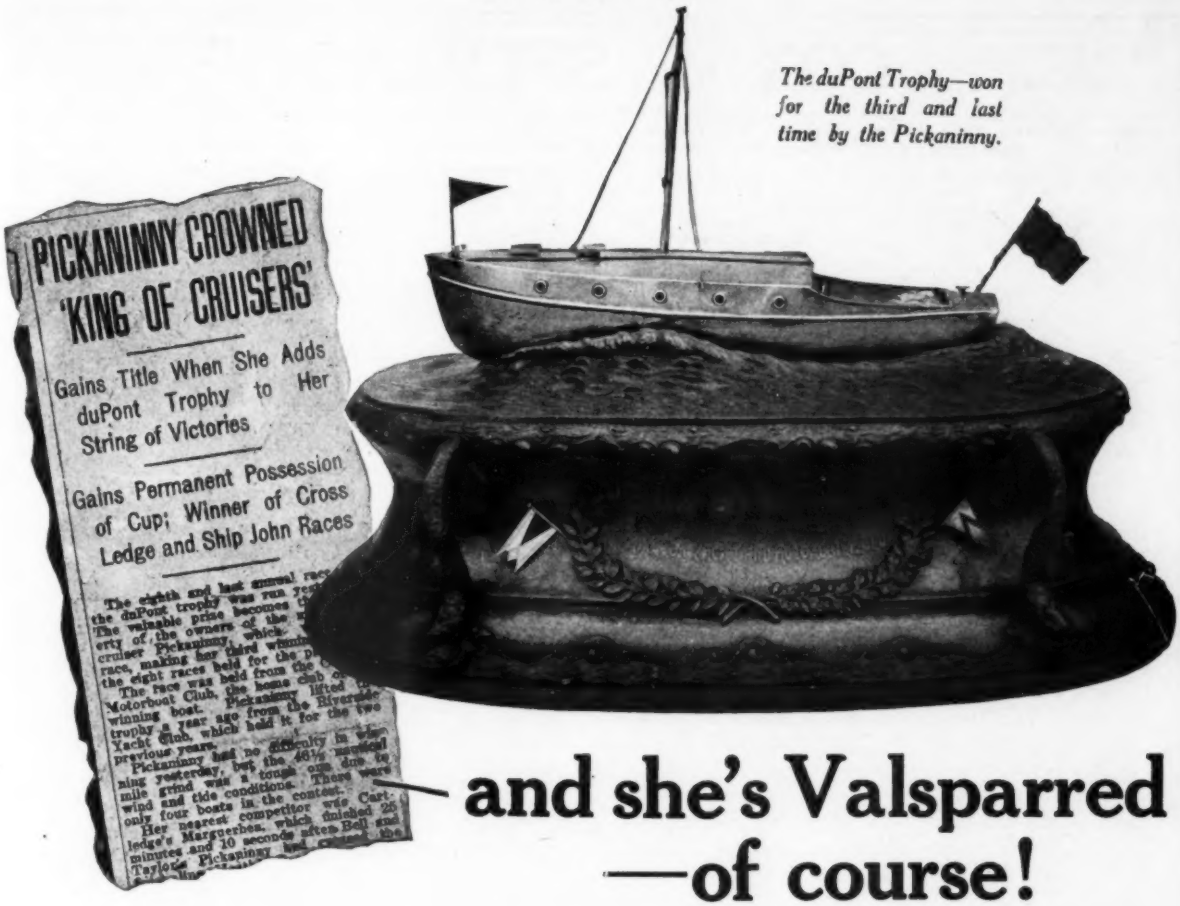
A spiling must be made for the garboard streak, the one next the keel: but the shapes of all the other planks are found by direct measurements as explained in Part VI. A boat which is carvel planked has an equal number of planks on both sides and for its full length, or at least should have, and these various widths are laid off around the frame of greatest girth and also at the bow and at the stern. Thus with three known widths for each plank it is an easy matter to determine the rest by using a batten as described in the beginning of the above paragraph.

Naturally, although at first thought it seems too simple to be true, the outline of the lower edge of the top streak will be the outline of the top edge of the next streak below. So before applying the top streak permanently lay it on a suitable board and take a likeness of its lower edge. What is true of the top streak is equally true of all the other planking, excepting the course that in working up from the garboard streak the process is reversed.

At first hand it may seem strange to proceed with the laying of the planking in this way: namely, applying from the sheer down and from the keel up, but it has many advantages.

After the sheer streak on each side and three of the wales are all in place the forms and bending battens may be removed, but not before the frame has been tied together at 3- or 4-foot intervals with temporary stays, and also at least three saw-bucked braces, one amidships and two at quarter length fore and aft of the first.

Fit and apply then the garboard streaks and the ones adjacent of which the forward ends must be steamed, gradually closing up the opening until (*Continued on page* 84)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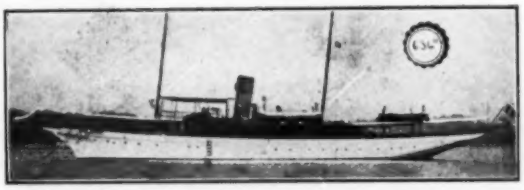
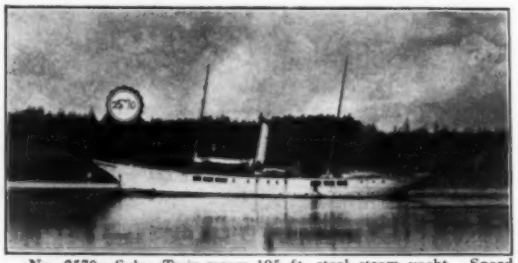
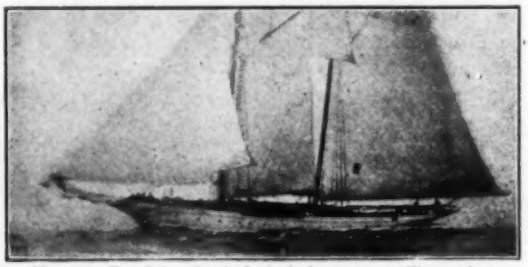
We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.



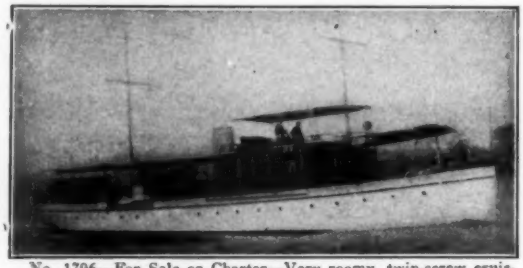
No. 636—For Sale or Charter—Modern 150 ft. steel steam yacht; most desirable of type and size available. Excellent accommodations; good speed. First class condition. Cox & Stevens, 15 William Street, New York.



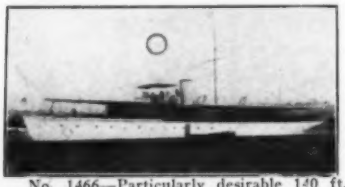
No. 2570—Sale—Twin-screw 195 ft. steel steam yacht. Speed 12 knots. Unusual accommodations both below and on deck. Lloyds highest rating. Ideal for offshore or coastwise cruising. Cox & Stevens, 15 William Street, New York.



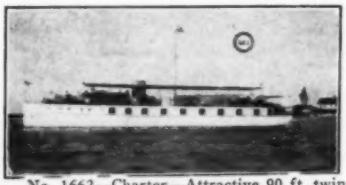
No. 148—For Sale—Steel, flush deck, steam auxiliary schooner yacht; 130 ft. overall, 110 ft. waterline, 26 ft. beam, 15.6 ft. draft. Speed under power 9 knots; compound engine; electric lights; all conveniences. Extremely able craft; heavily constructed. Cox & Stevens, 15 William Street, New York.



No. 1796—For Sale or Charter—Very roomy, twin-screw cruising power yacht, 99 x 17 x 4 ft. Speed 13 to 15 miles; Standard motors. Large dining saloon, six staterooms, three bathrooms, all conveniences. Cox & Stevens, 15 William Street, New York.



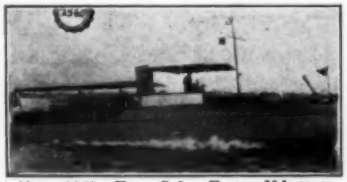
No. 1466—Particularly desirable 140 ft. twin-screw steel cruising power yacht; speed up to 18 miles; two 300 H.P. Standard motors. Dining saloon and social hall on deck; 3 double and 1 single staterooms, 3 bath and toilet rooms, etc. Recently overhauled thoroughly at large expense. In splendid condition. Further particulars from Cox & Stevens, 15 William Street, New York.



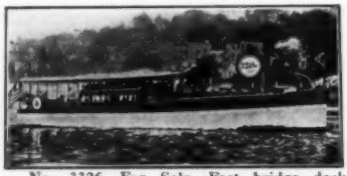
No. 1662—Charter—Attractive 90 ft. twin screw gasoline houseboat; speed 10-12 miles. Large saloon, four staterooms, two bathrooms; all conveniences. Handsomely furnished. Cox & Stevens, 15 William Street, New York.

No. 1806—For Florida Charter—Twin-screw power yacht; 67 x 14.6 x 3 ft. draft. Speed up to 13½ miles; two 40 H.P. Sterling motors. Large saloon with two extension berths, two staterooms, bath and toilet, galley, etc. Roomy bridge deck and large cockpit. Price attractive. Cox & Stevens, 15 William Street, New York.

No. 2425—For Sale or Charter—Twin screw cruising power yacht; 90 x 16.6 ft. Speed up to 12½ miles; two 6 cyl. 60/90 H.P. motors. Excellent accommodation. Now in commission. Cox & Stevens, 15 William Street, New York.



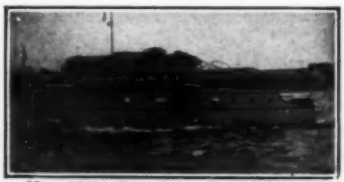
No. 2560—For Sale—Fast, V-bottom, twin screw power cruiser; 60 x 13 x 3 ft. Built 1917. Speed up to 18 miles; two 6 cyl. Sterling motors. Double stateroom forward; roomy saloon aft with separate galley; two toilet rooms (one with Sitz bath). Low price for quick sale. Cox & Stevens, 15 William Street, New York.



No. 3326—For Sale—Fast bridge deck cruiser; 55 x 8.9 x 3 ft. Speed up to 23 miles; 8 cyl., 200 H.P. Speedway motor. Two berths in cabin, toilet room, large cockpit, etc. Price attractive. Cox & Stevens, 15 William Street, New York.

No. 611—For Sale—Twin-screw power yacht; 75 x 13.3 x 5.6 ft. Speed up to 13 miles; two 6 cyl. 70 H.P. Sterling motors, saloon, two double, one single staterooms, bath and two toilet rooms, galley, etc. Price reasonable. Cox & Stevens, 15 William Street, New York.

No. 3153—For Sale—Attractive bridge deck cruiser; 53 x 12 x 3.10 ft. Speed 11½ miles; 45/55 H.P. Sterling motor. Large saloon, double stateroom, two toilet rooms, galley, etc. Cox & Stevens, 15 William Street New York.



No. 3560—For Sale—Fast bridge deck cruiser; 45 x 10.6 x 3.6 ft. New 1917. Speed 18 miles; 125 H.P. 6 cyl. Sterling motor. Double stateroom, saloon, galley, toilet room, etc. Price reasonable. Cox & Stevens, 15 William Street, New York.

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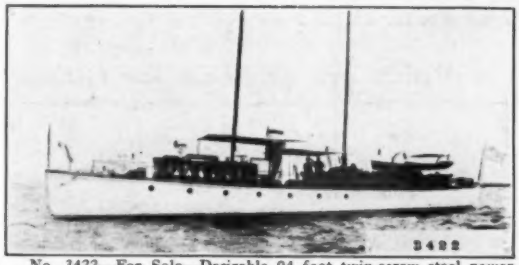
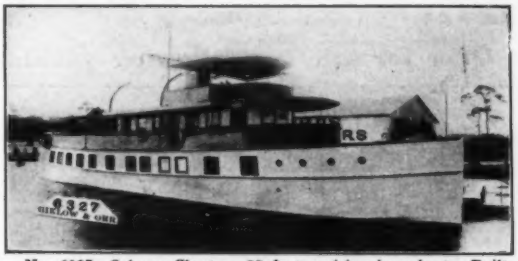
We have a most complete and up-to-date list of power yachts of all sizes, sail, auxiliary and houseboats on file in our office, kept constantly up-to-date by a thorough and comprehensive canvass of the entire yachting field from time to time. We are in a position to submit full information on any type of boat upon request. FOR SOUTHERN CRUISING this winter we offer a number of very desirable POWER HOUSE BOATS and POWER YACHTS which are specially adapted for FLORIDA waters

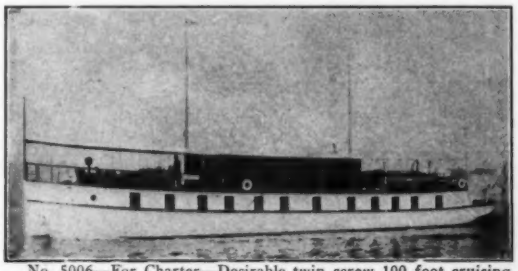


No. 3422—For Sale—Desirable 94 foot twin-screw steel power yacht. Deck dining room. Two double staterooms, bath and two toilets. Hot water heated. Standard engines. Speed 12 to 14 miles. Price reasonable. Gielow & Orr, 52 Broadway, New York City.

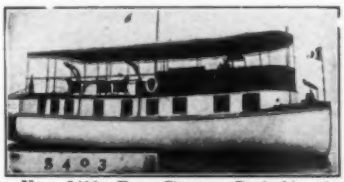


No. 6327—Sale or Charter—98 foot cruising houseboat. Built 1919. Owner's stateroom with adjoining bathroom and lounging room in deck house. Below five staterooms, three bathrooms and dining room. Gielow & Orr, 52 Broadway, New York City.

No. 4401—For Sale—137 ft. very attractive twin screw motor yacht. Speed 15 to 16 miles. Built by Lawley. Deck dining room and smoking room. Three double staterooms. Hot water heated. Price attractive. Gielow & Orr, 52 Broadway, New York City.

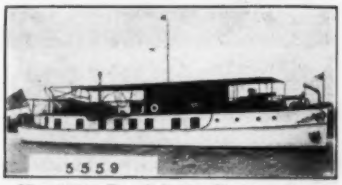


No. 5006—For Charter—Desirable twin screw 100 foot cruising houseboat. Speed 12 miles. Deck, dining room and lounging room. Seven staterooms, three bathrooms. Now in commission. Gielow & Orr, 52 Broadway, New York City.



No. 5403—For Charter—Desirable 51 foot houseboat. Standard motor. Large deck space. Two double and two single staterooms. Electric lights. Accommodations for seven persons. Gielow & Orr, 52 Broadway, New York City.

No. 2958—For Sale—Twin screw 120 foot steam yacht. Speed up to 24 miles. Deck dining room. Built by Seabury. Suitable for ferry or racing yacht tender. Gielow & Orr, 52 Broadway, New York City.

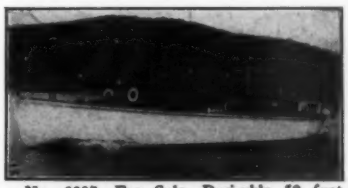


No. 5559—For Sale or Charter—Attractive 75 foot cruising houseboat. Standard engines. Deck lounging room. Three double and one single stateroom. Bathroom. Now in Florida. Gielow & Orr 52 Broadway, New York City.

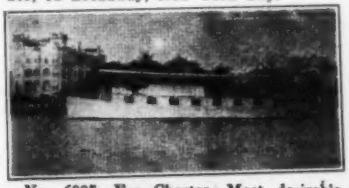
No. 2680—For Sale—Attractive 75 foot power yacht. Practically in commission. Two staterooms with double beds. Bathroom. Standard engine. Speed 12 miles. Able sea boat. Inspectable New York. Gielow & Orr, 52 Broadway, New York City.

No. 6418—For Sale—72 foot twin screw bridge deck cruiser. Built 1917. Winton motors, 150 H.P. each. Deck dining room. Two double staterooms, and bathroom. Electric and hot water heated. Gielow & Orr, 52 Broadway, New York City.

No. 6311—For Sale—115 foot twin screw steel power yacht. Standard motors, 100 H.P. each. Dining room in forward deck house. Social hall in after house. Four staterooms and bathroom. Gielow & Orr. 52 Broadway, New York City.



No. 3307—For Sale—Desirable 59 foot cruising power yacht. Standard engine. Double stateroom. Good sea boat, inspectable New York. Price attractive. Gielow & Orr, 52 Broadway, New York City.



No. 6097—For Charter—Most desirable 62 foot cruising houseboat. Large deck, lounging room, dining room, one double and two single staterooms, bathroom. Now in southern waters, available for coming season. Gielow & Orr, 52 Broadway New York City.

No. 6417—For Sale—45 foot hand express day cruiser. Built 1918. Speed 22 miles. Toilet room. Cabin and galley. Large cockpit. Gielow & Orr, 52 Broadway, New York City.

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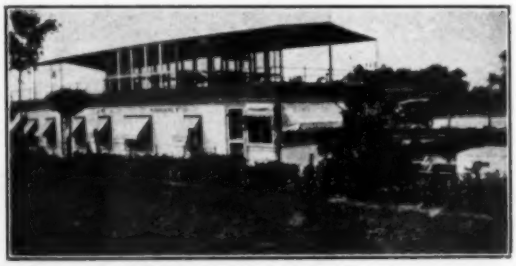
Offer for sale the following yachts, some of which are available for charter

No. 1927—Brand new houseboat available charter. Delivery Florida, February 1; 85 ft. overall, 19 ft. beam and 3 ft. draft, twin screw; 5 staterooms, 3 bathrooms and large deck saloon. Also sister ship for sale—Immediate New York delivery. Apply Tams, Lemoine & Crane, 52 Pine Street, New York.

No. 1926—Sale—Brand new houseboat in Florida waters 98 ft. x 20 ft. x 3 ft. draft; 100 H.P. motor; 6 staterooms, 3 bathrooms, dining saloon, sitting room, electric light and hot water heat. Also available charter from January 1. Full particulars, plans, etc. From Tams, Lemoine & Crane, 52 Pine Street, New York.

No. 7992—For Sale—Modern steel motor yacht, 115 ft. 7 in. x 17 ft. x 5 ft. 3 in. draft. 2—100 H.P. Standard motors. Speed 15 miles. Commodious owners' quarters.

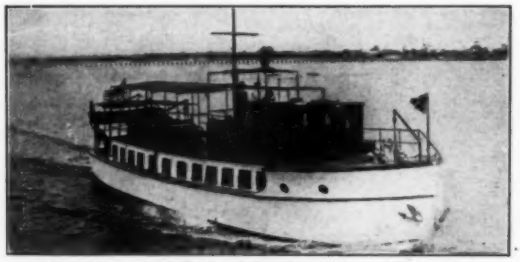
No. 1847—Available charter December, January, March and April, now in Florida waters, 85 ft. x 18 ft. x 28 ft. draft, 4 staterooms, bathroom, large dining and sitting rooms, etc.



No. 1934—Sale Bargain, houseboat 61 ft. overall by 24 ft. beam, 4 staterooms, dining room, living room, conservatory, bath, etc., hot water heat, electric light and refrigerating plant. Most luxuriously fitted and furnished.

No. 8102—Sale—Charter; most desirable raised deck cruiser available; practically new, 81 ft. x 13 ft. x 5 ft. draft. Speed 15 miles, electric light, hot water, heat and refrigerating plant.

No. 1902—Sale or Charter—In Florida. Most commodious houseboat of her length available; 64 ft. x 17 ft. 6 in. x 3 ft. 2 in. draft.



No. 1908—Sale or Charter—62 ft. desirable cruiser; good accommodations, now in Florida waters; single screw. Speed 8½ to 9 miles.

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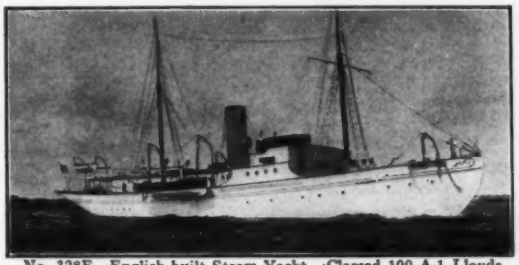
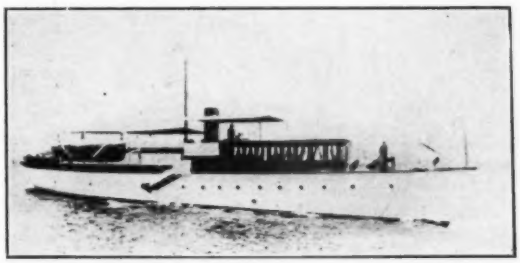
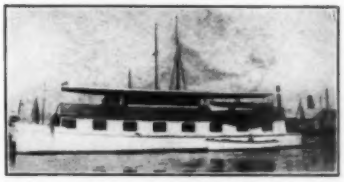


No. 328E—English built Steam Yacht. Classed 100 A-1 Lloyds. Inspectable New York waters. 151 x 24.9 x 12.9. Magnificent sea boat. Adapted extensive cruising. Exceptionally well arranged accommodations.

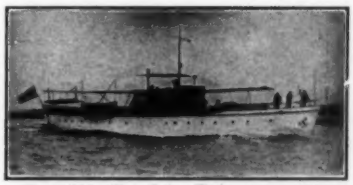


No. 1840—Attractive motor yacht, 107 x 95 x 18.3, best construction, two six cylinder Standards.

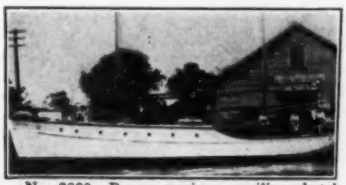
No. 2334—For Sale—New twin screw express cruiser, 85 x 14.3 x 4.3 Van Blerck engines. Speed up to 21 miles. Reasonable price.



No. 97—Charter—Florida houseboat, 62 x 17 x 3. Fifty horse power motor.



No. 1736—For Sale—Twin screw power yacht, 97 ft. x 16 ft. 7 in. x 3 ft. 6 in. 4 staterooms, bath room, deck, dining saloon, etc.

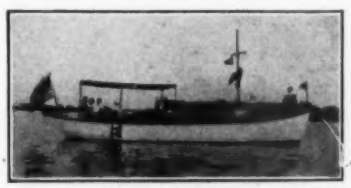


No. 2220—Roomy cruiser, auxiliary ketch rig, 60 x 15 x 4.6, built 1916, Clifton motor, two staterooms, bath, etc.

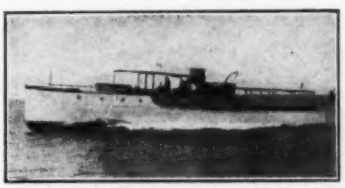
No. 1458—Raised deck cruiser, with bridge, 50 ft. x 11 ft. x 3 ft. 9 in.; fitted with 50 H.P. Ralaco motor; speed, 10 knots; sleeps 4 in Owner's party; Galley, two toilets, etc.

No. 2054—Fine Cruiser, 62 x 12.6. Four cylinder Murray & Tregurtha motor, speed 12 miles.

No. 2428—Cruiser with good deck space, 65 x 15.4. Six cylinder motor, complete equipment.



No. 2479—Palmer built cruiser, 36 x 9, sleeps four, 20 H.P. Palmer motor.



No. 2326—Express cruiser, 66 x 11.5, recent build, two 8 cylinder Van Blerck motors, speed 22 miles.

No. 1782—Bridge deck cruiser, 56 x 9.6, six cylinder, 100 H.P. motor, speed 16 miles.

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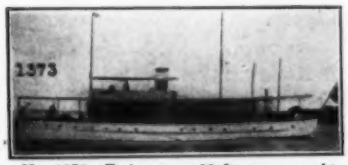
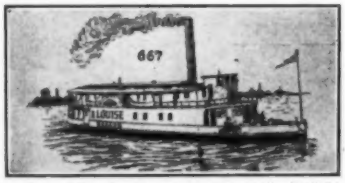


No. 1373—Twin screw 90 ft. power yacht. Four staterooms. Social hall, dining saloon, two baths, etc. Speed 13 miles.

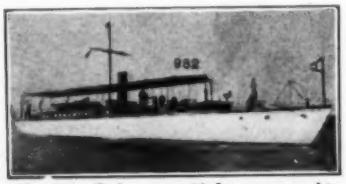
No. 830—80 ft. power yacht. Stateroom, two saloons, toilets, etc. 90 H.P. Sterling motor. Speed 12-14 miles. Price attractive.



No. 667—Steel passenger and freight steamer. Length, 140 ft.; breadth, 40 ft.; draft, 5 ft. loaded. Eight staterooms with 16 berths. Speed 9 miles. Price attractive.

No. 2376—175 ft. steam yacht. Eight staterooms, dining saloon, social hall, etc. Two bathrooms. Speed 13-16 knots.

No. 1859—32 ft. cruiser. Stateroom and cabin sleeps three, toilet, etc. 25-35 H.P. motor. Electric lights, etc.

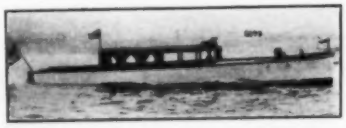


No. 982—Twin screw 90 ft. power yacht. Three staterooms, saloon, etc. Speed 14-16 miles.

No. 3554—68 ft. auxiliary keel yawl. Three staterooms, main saloon. Speed 7 miles. Price attractive.

No. 3760—80 ft. keel schooner. Designed and built by Lawley & Son. Two double staterooms, saloon, etc.

No. 1464—50 ft. express day cruiser. Sleeps two. 50-60 H.P. motor. Speed 16-18 miles.



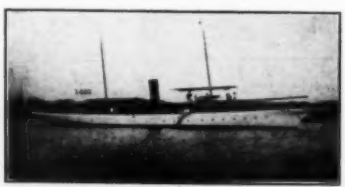
No. 2079—50 ft. express day cruiser. Speed 22 miles.

No. 1443—110 ft. twin screw power yacht. Five staterooms, dining saloon, baths, etc. Speed 11-12 knots.

No. 1756—Sale or Charter—65 ft. power yacht. Two staterooms. Main saloon, dining saloon, bath, etc. Speed 10-11 miles.

No. 1549—Sale or Charter—55 ft. twin screw cruiser. Double stateroom, main cabin, etc. Speed 12 miles.

No. 3932—65 ft. power houseboat. Four staterooms, bath, dining saloon, social hall, etc. Speed 8 miles. Located in Florida waters.



No. 1421—130 ft. steam yacht. In commission. Five staterooms, bath, dining saloon, smoking room, etc. Speed 10-12 knots. Can be bought for $7,500 for quick sale.

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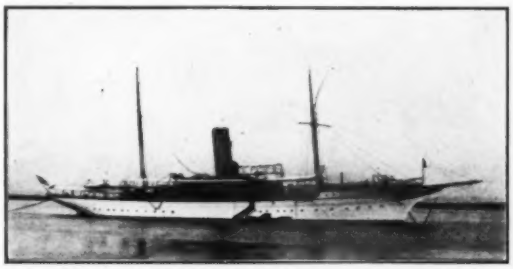
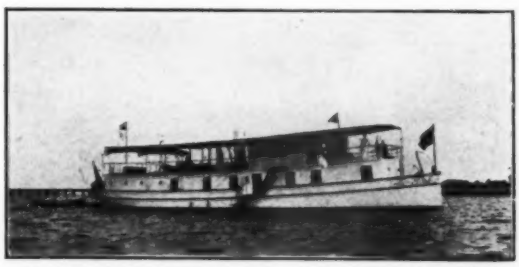
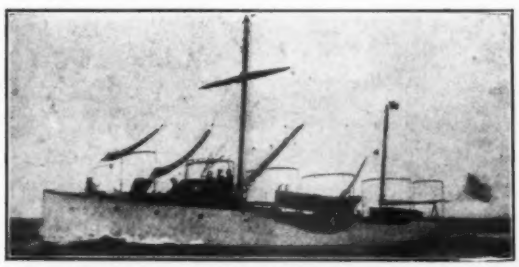


No. 7068—300 ft. (abt. 1200 tons) Ocean Going Steam Yacht—One of the finest vessels in the Fleet—in A 1 condition. FRANK BOWNE JONES, Agent, 29 Broadway, N. Y.

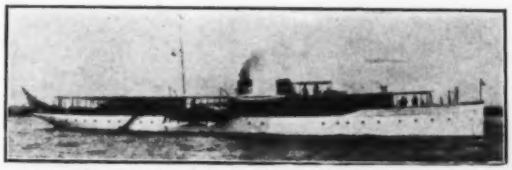


No. 2819—For Sale or Charter—105 ft. Power House Yacht now in Florida waters—most commodious boat—fully equipped and ready for winter service. FRANK BOWNE JONES, Agent, 29 Broadway, N. Y.

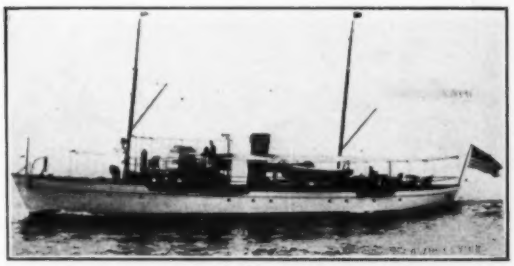


No. 4809—75 ft. Sea Going Auxiliary Cruiser—best design and build—reasonable price. FRANK BOWNE JONES, Agent, 29 Broadway, New York.

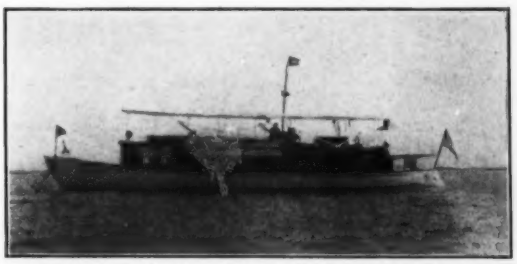
No. 4192—62 ft. Herreshoff Express Cruiser—twin screw—speed 25 miles—good accommodations—condition good as new. FRANK BOWNE JONES, Agent, 29 Broadway, N. Y.



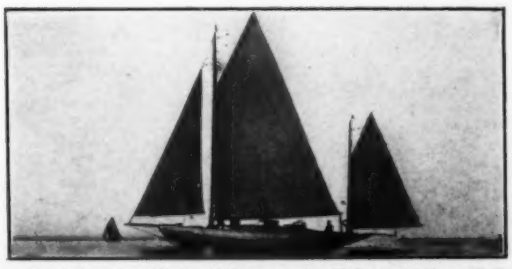
No. 4045—165 ft. Express Steam Yacht—latest type—twin screw—oil burning—splendid accommodations—an exceptional vessel. FRANK BOWNE JONES, Agent, 29 Broadway, N. Y.



No. 3191—For Sale or Charter—95 ft. Gasoline Yacht—exceptionally fine cruiser—twin screw—delivery in Florida waters—splendid proposition. FRANK BOWNE JONES, Agent, 29 Broadway, N. Y.



No. 6030—66 ft. Combination Houseboat and Cruiser—new Winton engine—12 miles speed—suitable for either southern or northern waters. FRANK BOWNE JONES, Agent, 29 Broadway, N. Y.



No. 2100—Aux Yawl—46 ft. over all—32 ft. water line—13 ft. beam—6 ft. draft—of the best design and build—good accommodations—Sterling motor. FRANK BOWNE JONES, Agent, 29 Broadway, N. Y.

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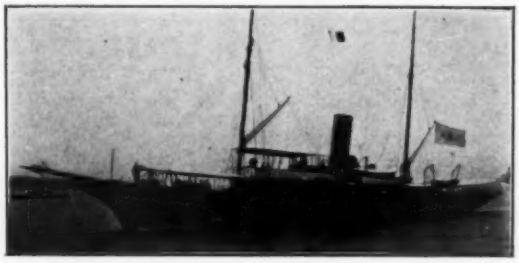
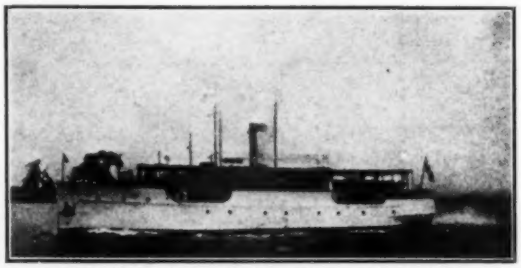
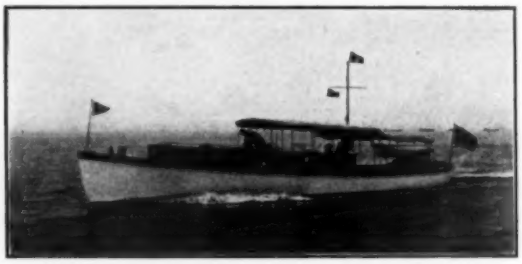


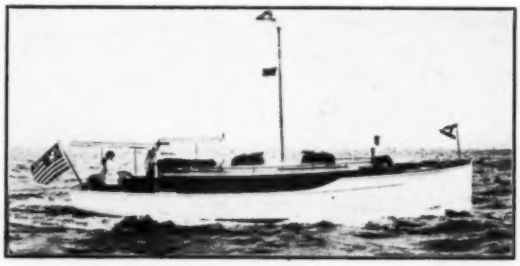
No. 2500—For Sale—Single screw steam yacht, 170 ft. x 23 ft. x 10 ft. draft. Sleeping accommodations for twelve. Three bath rooms. Price attractive. Speed up to 13 knots.



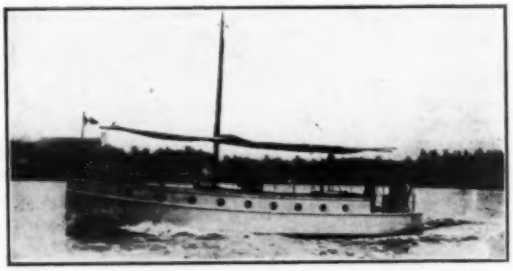
No. 2501—For Sale—Deck cabin cruiser, 71 ft. x 16 ft. x 3 ft. 6 in. draft. Ideal boat for Southern waters. Fully equipped. Inspectable near New York.



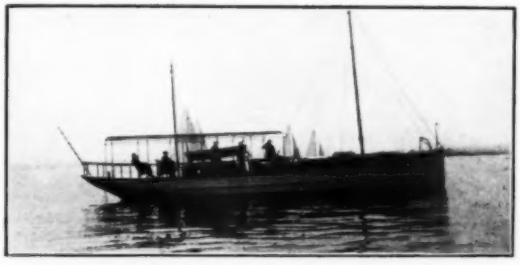
No. 2502—For Sale—Crosby built cruiser, 59 ft. x 11 ft. x 3 ft. 3 in. draft. 6 cylinder Standard Motor. Speed 12 miles per hour. 1 double stateroom, transom berths, galley, etc. Excellent condition.



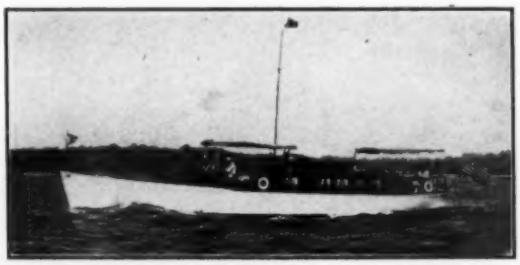
No. 2503—For Sale—Cabin cruiser, 40 ft. x 11 ft. x 3 ft. draft. 40 H.P. Lamb Motor. Mahogany finish, 1 double stateroom; sleeping accommodations for 5. Speed 12 miles per hour.



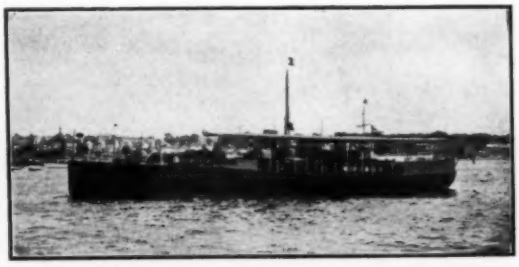
No. 2504—For Sale—Raised deck cruiser. Built in 1915. 46 ft. x 11 ft. x 3 ft. 6 in. draft. 5 H.P. Sterling Motor; independent lighting system. Speed 10 miles per hour. Bath, toilet, galley, etc. Inside finish ,white enamel and mahogany.



No. 2505—For Sale—Cabin cruiser, 61 ft. x 11 ft. x 4 ft. 10 in. draft. Excellent accommodations. 4 cylinder Palmer Motor. Best design and build; fine sea boat.



No. 2506—For Sale—Desirable, bridge control cruiser, 55 ft. x 10 ft. x 4 ft. draft. New 4 cylinder Sterling Motor. Speed 12 miles per hour. Double stateroom, transom berths, galley, toilet, etc. Can be placed in commission at small cost. Exceptional bargain.



No. 2507—For Sale—Trunk cabin cruiser; designed by Barney, built by Luders; 70 ft. x 11 ft. x 3 ft. 10 in. draft; fully equipped; excellent accommodations. 6 cylinder 6 ft. x 9 ft Holmes Motor. Speed 12 miles per hour.

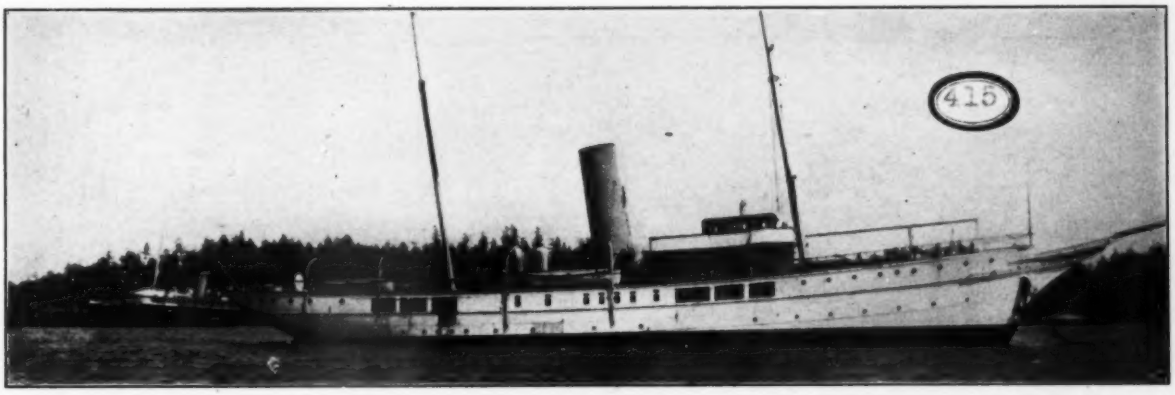
Advertising Index will be found on page 156

EDWARD P. FARLEY CO.,

Railway Exchange Bldg., Chicago, Ill.
Telephone Har. 1343

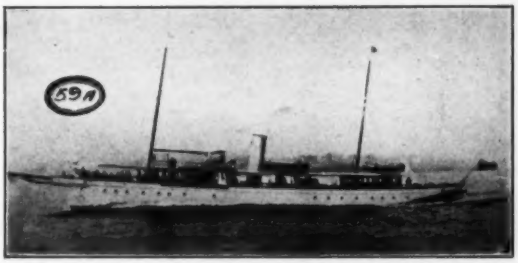
Naval Architects, Yacht Brokers, Surveying, Marine Insurance

We have a complete list of all Steam and Power Yachts, Auxiliaries and Houseboats which are offered for sale and charter.
Plans, Photographs and full particulars furnished on request.

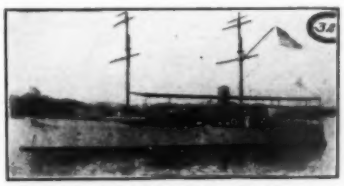


No. 415—For Sale or Charter—Thoroughly modern, twin screw, steel, steam yacht. 192 ft. O.A., 32 ft. beam, 13 ft. draft. Recently built in Scotland to Lloyd's highest class. Excellent seaboat. Designed for extensive off-shore cruising. Cold storage, wireless, etc. Cruising speed 11 to 12 knots. Has not been in Government service. Drawing room. Best yacht of type available, was thoroughly overhauled and refitted this year.

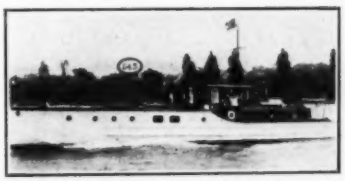
No. 116—For Sale—Twin screw steel steam yacht, 227 ft. x 24 ft. 6 in. x 10 ft. draft. Five single and two double staterooms. Four bathrooms. Two deckhouses containing dining saloon and social hall. Speed up to 22 knots.



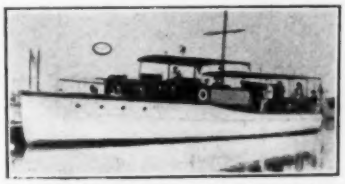
No. 59a—For Sale—170 ft. steel steam yacht. Six double staterooms, large dining saloon and social hall on deck. Triple expansion engine. Speed up to 16 miles. Excellent condition.



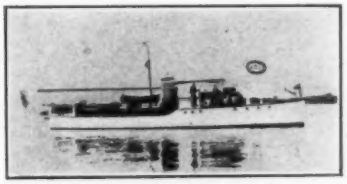
No. 324—For Sale—68 ft. cruising power yacht. Brigantine rigged. 13 ft. 6 in. beam, 5 ft. draft. Two double staterooms, commodious dining saloon. 8 cyl. Sterling motor. Cruising speed 13 miles. Independent electric light plant. Has received exceptional care and is in the best possible condition.



No. 543—For Sale—63 ft. twin screw, bridge deck cruiser. Built in 1917. 12 ft. 3 in. beam, 3 ft. 4 in. draft. Two staterooms, bath and dining saloon. Van Blerck motors. Speed 16 miles. Was not in the naval service and is in excellent condition. Fully equipped.

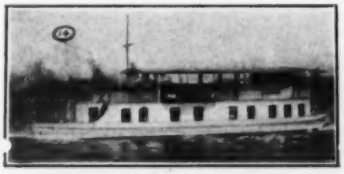


No. 928—For Sale—Bridge deck cruiser. Built in 1919 by Matthews. Length 58 ft., beam 13 ft., draft 4 ft. 6 in. Speed 11 miles. Two double staterooms, bath, dining saloon. Exceptionally well built and in very best condition. Has hardly been used.



No. 931—For Sale—72 ft. twin screw cruiser. 12 ft. 3 in. beam, 3 ft. 6 in. draft. Built by Lawley in 1917. Two Winton motors. Accommodate six, besides crew. Well built, in good condition, and exceptionally seaworthy. The boat is fully equipped with every modern convenience.

No 83—For Sale—85 ft. twin screw cruising yacht. 16 ft. 7 in. beam, 3 ft. 6 in. draft. Excellent for southern cruising. Three double, one single staterooms, bath, also dining saloon on deck. Cruising speed 14 miles. Is in excellent condition and fully equipped with every modern convenience.



No. 14—For Sale—70 ft. twin screw, Mathis built houseboat. 18 ft. 6 in. beam, 1 ft. 6 in. draft. Three staterooms, bath, dining saloon. Sterling motor installed 1915. Speed 10 miles. Well equipped and in good condition. Price very reasonable.

THE MOTOR BOATING MARKET PLACE

The rate for "For Sale" and "Want" advertisements is 3 cents per word, minimum 75 cents. If an illustration is used, the charge is as follows, which includes the making of the cut:
Cut one inch deep, one column wide..... $3
Cut 1½ inches deep, 1½ columns wide..... $5
Cut 2¼ inches deep, three columns wide..... $15

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offer of the month. Please mention MoToR BoatinG.

(This photograph gives a fairly good idea of the express cruiser "Quirl" but does not do her justice)

GOING TO FLORIDA THIS WINTER?

Of course you'll want your own boat. Nothing more delightful than to cruise and fish among the Florida keys, taking your own little home with you wherever you go. Don't wake up at the last moment only to find that there are no satisfactory boats available anywhere, either for sale or charter. Too late to build one now and would cost much more for something not as good.

My express cruiser "Quirl" is for sale. For business reasons cannot use her this winter. Price $22,500, cash. Buyer will have no ten per cent government luxury tax to pay. Immediate delivery. Length 50 ft., beam 10 ft.; 3 cabins, galley, engine room. Sleeps eight people. 200 h. p. 8-cylinder Van Blerck engine. Leece-Neville self-starting and lighting system. One man control from bridge. Speed 22 miles per hour. Practically new, never having been used except for trial trip. Manufacturer's covers still on upholstery. Built by Great Lakes Boat Building Corporation, largest builders of express cruisers in America. Now stored under cover with Geo. B. Lawley & Son Corporation, Neponset, Boston, Massachusetts, on a cradle ready for shipment by rail to Florida or elsewhere, or able to go under own power.

Address, Paul Watkins, Winona, Minn.

FOR SALE: 38-ft. Speedway Launch. 6 ft. beam. 135 H.P. Sterling Engine with self starter. Speed 24 miles. Good condition. Can be seen at THE ELCO WORKS, Bayonne, N. J.

Wanted—A four cylinder four cycle modern marine motor, 5½ bore with electric starter. Give manufacturer's number and model with complete description. For cash. Address Cash, care MoToR BoatinG, Box 27.

WATER FRONT WINTER HOMES

Yachtsmen who winter in Florida should own water-front homes with riparian rights. We have for sale water-front lots, acreage and fine homes on beautiful Indian River, Sewell's Point, South Side St., Lucie River overlooking Gilberts Bar Inlet, the noted fishing ground, also on the shores of Biscayne Bay, Little River and Miami River. Prices right and cheerfully given on request.

WATERS REALTY COMPANY,
1107 Avenue B, Miami, Florida.

Wanted—Speedway runabout between thirty and thirty-five feet. State price, full particulars and where boat can be seen. Henry Keil, 401 East 163rd St., New York City.

Trimount Whistle Blower Outfits
Blower runs by friction contact with engine flywheel. Whistle of brass, nickel-plated.
Made in 3 sizes.

Trimount Rotary Hand Bilge Pumps
All bronze composition. Suction lift 8 to 20 feet. A lifelong convenience.
Made in 3 sizes.

TRIMOUNT ROTARY POWER CO.
20 Heath Street Boston, Mass.
(Factory: 292 Whiting Ave., East Dedham, Mass.)

Wanted a 50 to 60 ft. beamy cruiser or cruising houseboat. Must have at least two staterooms. Mahogany, other bright work and speed not as essential as stability, comfort and economical maintenance. Address Chesapeake, care of MoToR BoatinG.

For Sale: The 40 ft. raised-deck cruiser WACHUSETT complete to the minutest detail and every possible convenience. Double stateroom and saloon, sleeping 4 to 6 in owner's party. Price $4,000. Cannot be duplicated for less than $8,000. Ideal boat for trip to Florida. For complete description including photo write Castle, Lincoln Bldg., Phila., Pa.

Wanted: Steel Seagoing yacht—100 to 130 ft. x 17 ft. to 20 ft. x 5½ ft. to 7 ft. motor drive, make not less than 16 knots, fully equipped, state name of builder, date, etc., send photo and full particulars. Must be cheap and good terms. Address Florida Electric Welding Co., Tampa, Florida.

For Sale: 25 foot motor boat hull. Never in the water. No motor installed, will stand full inspection. A bargain if taken now. I. C. Murray, Traverse City, Mich.

For Sale: Light weight high-speed 8-cylinder, V-type, 4-cycle racing motor. Used one season in hydroplane. Also 20-ft. mahogany hydroplane hull with gear drive, shaft, etc. Vicinity, Philadelphia. H. L. Hess, The Hess Steel Corp., Baltimore, Md.

Wanted: Position by responsible man as operator of a motor boat at Palm Beach or Miami for winter. Six years experience at these places, three years in party business at Palm Beach. Age 25 years. Licensed in Jacksonville District. best references given. H. L. Arnold, Milan, Ohio.

BARGAINS BARGAINS

EAGLE TWO CYCLE ENGINES

We purpose to close out at greatly reduced prices our entire stock of "Eagle" two cycle engines, as we intend to discontinue the manufacture of this type of engine in the future. Write at once for information to the

TORRINGTON COMPANY
STANDARD PLANT
Torrington, Conn.

Auto Motors Supplies—Buick, Michigan, Stoddard, Dayton, Hupp 32, Cadillac, Overland, E.M.F., Continental and Buda motors. All types $50 each and up. Bosch Magnetos, $15 each and up. Special High Tension 2 and 4 cylinder magnetos, $9.50 each. Prest-O-Lite Tanks, $5.00. Coils, Carburetors, Air Compressors, Generator, Starters, etc. Write for Bargain Bulletin. Second Hand Auto Accessories. Address Motor Sales Dept. B, West End, Pittsburgh, Penna.

Wanted: Triple expansion steam engine between 50 and 75 H.P. Good condition essential. Must be very cheap for cash. N. H. Hilton, Box 251, Ilwaco, Wash.

One cyl. Two cycle 1½ H.P. Truscott.	$22.	5 6	H.P. Detroit.	$55. 65.
1½ H.P. Motorgo.	26.	7½	H.P. Gray...	
2 H.P. American and wheel.....	34.	7½ 10	H.P. Pierce and gear..... H.P. Truscott. H.P. Truscott 6½ x 6½ with 3-blade 20 in. propeller outfit.	75. 65. 110.
3 H.P. Ferro and wheel	45.			
3½ H.P. Gray and wheel	55.			

Also 5 H.P. Brush one cyl. four cycle, $55; 6 H.P. Milwaukee one cyl. four cycle in new stock, $135; 22 H.P. Vim three cyl. two cycle, $135; 18 H.P. Fairbanks-Morse three cyl. two cycle, $195; 30 H.P. Termaat-Monahan 5 x 5 two cycle four cyl., $235, and others. Also large line of auto engines, fine for marine use, stationary as well as tractor engines. Supplies of every nature at low prices. We take engines in trade and buy them. What have you? Badger Motor Company, Milwaukee, Wis.

Two cyl. Two cycle 10 H.P. Waterman	$75.	12 15	H.P. Detroit. H.P. Ferro 5 x 5	$90. 110.
8-10 H.P. Gray with gear and wheel	115.	15	H.P. Knox heavy duty with gear....	235.
12 H.P. Racine..	75.			
12 H.P. Wisconsin	95.	18	H.P. Vim with gear	105.

Advertising Index will be found on page 156

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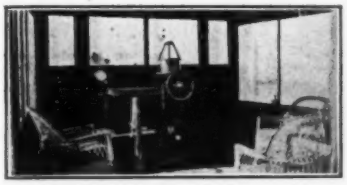

FOR SALE OR CHARTER:—Motor yacht "Tramp". 56 feet over all, 11 foot beam and 3 foot draft. Designed and built by George Lawley Corporation. A large aft state room, finished entirely in mahogany and teak wood, newly upholstered and carpeted, contains a three-quarter bed, two transom berths, toilet and clothes closet. Forward state room finished in Butternut, natural finish, two berths and toilet. Large galley, width of boat, containing a three burner, alcohol, Seabury stove. Ice box holds 250 pounds of ice. Large well lighted and ventilated engine room containing two transom berths. Steel bulkhead dividing engine room from aft cabin. One man control; all controls and starter brought to bridge. Deck space unusually large. Bridge deck 11 by 12 feet; aft deck 10 feet. Two new tenders, one motor. Engine—new 1919, heavy duty, 35-85 H.P., Sterling. Speed guaranteed 11 miles per hour. Gasoline capacity two 100 gallon copper tanks. Furnishings of boat such as blankets, etc., never been used. Boat not in Naval service. Can be placed in commission on short notice. Asking price for sale $10,000. Charter price on application. For further details and inspection—A. W. George, 43 Bay State Rd., Boston, Mass.

For Sale:—This beautiful runabout, powered with a FS, 6 cyl. Sterling motor. A Hacker designed and built boat with all the usual high grade Hacker workmanship, it is ready for IMMEDIATE delivery. Note the great carrying capacity, the forward cockpit and the forward control. This runabout is fast, it has done better than 32 m.p.h. and is ready at this minute for a day's run at better than 30 miles. If you are interested in this write to us for more data and price. Hacker Boat Co., 323 Crane Ave., Detroit, Mich.

FOR SALE

EXPRESS CRUISER: 40 ft. x 10 ft. speed 17 miles, one man boat. ENGINE: Sterling 90 H.P. 6 cylinder, Bosch self starter, Bosch Generator, Bosch Dual Waterproof High Tension Magneto and Coil. Rebuilt this fall and guaranteed in perfect condition. All controls on deck. HULL: Copper riveted, cedar and mahogany throughout, electric lighted; toilet room; cabinet (sleeps three); engine room forward; galley and locker, large deck space aft; entirely upholstered; mahogany windshield and top. Hull chaulked this last spring (guaranteed water tight); all fittings rudder, shoe and shaft, solid bronze. Copper tanks gas 140 gallons, water 40 gallons. Wonderful sea boat, won express cruiser championship for 1919. Built in a well-known eastern yard and designed by a leading naval architect. Put up for the winter within a few miles of Philadelphia and can be put in commission in two days' time. My price, $3,750.00 cost more than double. Fully guaranteed. Address Box "22" MoToR BoatinG.

CANADIANS, Second-hand engine bargains. Send for list.
GUARANTEE MOTOR COMPANY
73 Bay Street, North Hamilton, Ont., Canada

Use "SNAPPER" ENGINES for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

For Sale—1-four cylinder 6 by 8, two cycle, Heavy Duty Marine Motor in first-class condition. Zintz manufacturer, $150.00 F. O. B., Washington, D. C., Percy M. Child, 1110 14th St., N. W.

23 MILES IN RACING TRIM.

28 foot V-bottom runabout, full mahogany, in perfect condition; with full equipment including electric starter, auto top, etc. Address Box 42, care of MoToR BoatinG.

Up-to-the-minute marine motor 4 cylinder 4 cycle 40 H.P. at 1,000 r.p.m. run about 250 hours equipped with self-starter, detachable cylinder head, all parts enclosed, built in reverse gear. Box 43, care of MoToR BoatinG.

Wanted bargains lots of motors—magnetos—carburetors—plugs and all motor or motor boat supplies. DeGraaf, 27 Houttuin, Rotterdam, Holland.

For Sale—2-20-35 H.P. Sterling engines, full equipment, self starters, aluminum bases, 2 General Electric Lighting Units 3 K.W. batteries. Direct connected generators and switch board complete. Grisdale & Baugh, Lake Placid, New York.

For Sale—1-7-inch Deck Type Carliale & Finch Arc Marine Search Lamp. Brass $50.00. 1110 14th St. N.W., Washington, D. C., Percy M. Child.

For Sale: Two 40-45 Buffalo gasolene motors right and left, seen about 2 years service. Good condition. Garret & Co., Hammondsport, New York.

Wanted—Wherever there are boats, representatives to handle our speed indicators, taffrail logs, and marine meters selling from $8 to $65. Can you consider a good proposition? Write for details. Irvin W. Masters, Muncie, Ind., U. S. A.

One Buffalo four cyl. 7 x 9 heavy duty marine engine with full equipment including reverse gear, shaft, 36" three blade bronze wheel, stuffing boxes, pipes and fittings. Rate 40-45 H.P. at 350 R.P.M. Factory price, $2750. Engine used but six months and in first class condition. Offered for quick sale at low price of $950. Badger Motor Company Milwaukee, Wisc.

Sale: 6 cyl. Pierce-Arrow 66 H.P. $250.00. 3 cyl. Rice 2 cycle 20 H.P. with A. K. Ignition, reverse propeller and shaft complete $140.00. 10 ft. and 5 ft. lengths bronze shaft 1½ inch diameter $15.00 and $7.00. Hor. Gray stationary 3½ H.P. (new) $40.00. Hyde propeller (new) 20 x 24 inches. Gordon Baxter, Palmyra, N. J.

Bargain: for sale or trade 17 ton freight boat length 56 ft. 4 in. beam, 15 ft. 4 in. depth, 4 ft. 4 in. width, 54 H.P. Buffalo engine, make good tow boat. Round bottom in A-1 condition, here is your chance. T. E. Preiss, Cortez, Fla.

Wanted—1-1½ or 3 Kw. Direct Connected 110-volt Gasoline Electric Light Plant. Must be 4-cycle motor equal to No. 2 Carliale & Finch Plant. Percy M. Child, 1110-14th St., N.W., Washington, D. C.

Wanted:—33—40 ft. sea going cabin cruiser of professional construction with full head room, modern engine, speed 10 miles or better, not over 6 years old. Photos returned. All communications acknowledged giving lowest cash price and full particulars. Address Frank O'Brien, 545 Mass. Ave., Cambridge, Mass.

USED MATTHEWS ELECTRIC LIGHTING PLANTS. Automatic Marine and Land types—one and two kilowatts—32 volt—attractive prices—Widger & Miller Co., Matthews Dealers, 141 Milk St., Boston, Mass.

PRACTICAL MOTOR BOAT HANDLING

SEAMANSHIP AND PILOTING

(Fifth Edition)

A handbook of information about boats and boat handling which every boat owner should know. It constitutes a complete and comprehensive but non-technical guide upon which you can rely from the time you leave your anchorage until you return, regardless of what emergencies may arise. Written by Chas. F. Chapman, M.E., editor of MoToR BoatinG.

Price $1.00 per Copy.

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Gentlemen:
Enclosed find $1.00 for a copy of "Practical Motor Boat Handling." Mail the book postpaid to
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258 ATLANTIC STREET, STAMFORD, CONN.
UP TO DATE DESIGNS
Build a real boat that you will be proud of. Boats designed by Gardner need no other recommendation. Complete plans and full size patterns furnished. Fast V-bottom boats a specialty. Hydroplanes, Auxiliaries and Sea-going Cruisers. Fast 20 ft. runabout designed for Ford Auto Engine. Blue Prints on request.

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501 FIFTH AVE., at 42nd St., N. Y.
Desirable yachts of all types for sale and charter
Telephone 949 Vanderbilt

What Were the Faults of the Subchasers

(*Continued from page* 12)

There was one feature of the design of this class of boat that ever was and always will be incomprehensible to me—the division of the four fuel tanks into two separate units. The after, or main tanks, as they were called, filled from the bridge and fed from the engines. The forward or storage tanks were not connected with the main tanks, although they were only a few inches apart, and could not be emptied by gravity or vacuum feed. As I have not been taken into the confidence of the designer I can only surmise that this division was made to reduce the risk of fire. As a matter of fact, it increased the risk, since upon draining the main tanks we were obliged to uncover them and pump them full from the storage tanks—a laborious process at best, and one attended by other than fire risk when there was a high sea running. While pumping gas it was necessary to cover the engine-room ventilators and close all ports and hatches not already closed by stress of weather, throw the lighting switches and discontinue the radio watch.

Sometimes while underway with a tanker on a long voyage we would barely finish transferring gas from the forward to the after tanks before being ordered alongside the tanker to refuel. So at the expenditure of two hours' time and a certain wastage of gasoline we emptied our forward tanks only to refill them immediately. I should like to advise prospective motor boat builders to connect all their fuel tanks in series (equipping them with the requisite cut-off valves), no matter what argument may be put forward on the advantage of always having a reserve supply on hand. If an owner cannot remember to measure his tanks at stated intervals, he is entitled to hire an observer to look after this item and to see that he doesn't pour bilge water into his lubricating tank.

The fire danger aboard the chasers was acute at all times and never more so than when an accumulation of water was allowed to collect in the bilges. Gasoline and oil drippings from the engines floated on the top of the water and there was needed only a backfire or a spark from a loose wire to ignite the vapors and make the engine-room an inferno of flames. Besides three or four disastrous fires which were mentioned in the daily press there were many smaller ones that caused great anxiety before they were subdued. I remember one explosion that lifted the roof of the engine house from its fastenings and sent two men to the sick bay for a period of weeks. In this instance the explosion of the combustible mixture was not followed by a conflagration, but the attending circumstances stopped just short of tragedy. A wherry in the act of coming alongside the chaser capsized and two of its occupants who were unable to swim nearly drowned in the ensuing confusion. The chaser officers, both level headed men, were utterly bewildered for an appreciable interval, and five minutes after the excitement had subsided one of the crew walked to the bow of the boat like a man in a trance and dived overboard. All hands on all the chasers had an ingrained dread of fire, and I know that many a heart-felt sigh of relief went up when the engines were rung down for the last time in the home yards.

But in spite of the faults mentioned, the submarine chasers were a success, and it would serve no good purpose to dwell on

(*Continued on page* 68)

Advertising Index will be found on page 156

110-Ft. Yacht "CONSUELO"

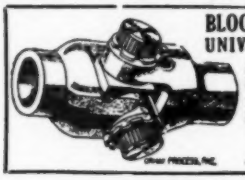
Sixteen Years' Designing Experience
Specialty Seagoing Yachts
J. MURRAY WATTS, N. A.
136 South Fourth St. Philadelphia
Phone: Lombard 2072

BRUNS, KIMBALL & CO., Inc.
153-5-9 West 15th St., New York City
Offer over 200 re-built engines, backed by a strict guarantee, at especially attractive prices. List will be sent free for the asking. Your present engine will be taken in part payment for a new Sterling, Kermath, Gray, Prior, Doman, Missouri, Universal, 4 cycle; Eagle, Hartford and Arrow, 2 cycle; Missouri heavy oil engines, simple and economical. Burnoil, heavy duty 4 cycle heavy oil engines, quick starting, economical, easy to operate. Write for offer.

Hamilton Marine Engine Exchange, Inc.
440-444 Fifty-Second St., Brooklyn, New York
All sizes rebuilt Marine Engines from one to 300 H.P. in stock.
A pair Lamb 60-80 H.P. ..... $2400 00 complete
Craig 100 H.P. ..... 1800.00 complete
A pair Speedway 60 H.P. ..... 1850.00 complete
20th Century 4 cylinder ..... 600.00 complete
and 100 others.
Send for bargain list, prices are right.

CAPE COD SHIPYARD, Builders of craft up to 150 ft. length.

CAPE COD POWER DORY CO.
Factory—Wareham, Mass., 367 Main St., Tel. 5-6
Showrooms at 412 Eighth Ave., New York City


BLOOD BROTHERS UNIVERSAL JOINTS
Absolutely Dependable
Do Not Throw Grease
Blood Bros. Machine Co.
Pioneer Makers of Universal Joints
Allegan Mich.

You Can Build Your Own Boat
and save 2/3 the cost by the BROOKS K. D. SYSTEM.
Send for catalogue showing all models.
BROOKS MFG. CO., 1101 RUST AVE. SAGINAW, MICH

BUILD YOUR OWN BOAT

—Cruiser, work boat, open launch or row-boat—from our knock-down frames or patterns. Save ½ to ¾ the Cost. Catalog on request.
DETROIT BOAT & MOTOR WORKS
3218 State St., Bay City, Mich.

INTRODUCED 1907
TRADE NUPRO MARK
REGISTERED
NUPRO MARINE GLUE
for deck seams and stopping leaks in boats. Elastic. Adhesive.
NUPRO COPPER PAINTS are best for protecting wood hulls from worms and growths.
Shipchandlers: Write for prices.
NEW PROCESS CHEMICAL CO.
38-41 Cortlandt St. New York City

"CURTINMADE"
Canvas Goods
JOHN CURTIN CORPORATION
Reg. U. S. Pat. Off. 48 FRONT ST. NEW YORK

Like the Lookout On the Bridge, the Boyce Moto-Meter Gives Warning of Impending Danger

Keeps Engine Trouble Away

It is scarcely less foolhardy to guess about the condition of your motor than to guess about rocks and shoals. It's a big risk.

You can't *see* your engine overheating. You can't hear it, feel it, smell it. Yet when it does overheat, without warning, you have motor-breakdown, burned out bearings—no end of costly mischief. And if you're far from shore—is it pleasant? Is it *safe?*

With a Boyce Moto-Meter aboard, you are never in doubt as to what is going on in the engine. The least change in the performance of the motor is instantly registered on the Boyce Moto-Meter dial, right before your eyes.

The Boyce Moto-Meter always gives warning in plenty of time to prevent trouble—long before the engine has overheated to the danger point. Then, if the engine is too cool—wasting fuel—the Boyce Moto-Meter tells you about it.

For motor efficiency, for human safety—no other instrument is more essential than the Boyce Moto-Meter.

The Moto-Meter Company, Inc.
Long Island City
New York

Yard and Shop

Notes of Interest to Both Owner and Manufacturer

Roach Trophy Races on Pacific

Interest is stirring in racing on the Pacific Coast, Los Angeles, where there is no winter and no season of inactivity, promises to become a great center of motor boat racing enthusiasm. This will be welcome news to the racing world and will tend to bridge the gap between the general closing of the summer season on Labor Day and the spring opening in February in Florida. The arrival of motor boat racing is being encouraged by such local power boat enthusiasts as Frank Garbutt, Dustin Farnum, and Joe Fellows. Much rivalry already exists among these sportsmen, each contending that his particular boat is the fastest afloat.

Hal E. Roach of the Los Angeles Motor Boat Club has offered a very valuable gold and bronze trophy, to be competed for in Southern California. This trophy was ordered from Dieges & Clust of New York by Mr. Roach on his recent visit to the East. It is being designed and manufactured under the supervision of MoToR BoaTinG. It is confidently expected that distant owners of fast motor boats will come to Los Angeles to try for this handsome trophy, as it will be well worth competing for.

The rules for this contest are being formulated and it is expected to make it a free-for-all speed contest for the fastest mile each day of racing. It is intended to be a series contest and the winner of three successive races is to be declared the winner of the trophy. The races are to start at 11 A. M. each day of racing and only one contestant will be permitted on the course at a time.

An entrance fee of $25 must accompany each entry as an evidence of good faith. Of this, $15 is to be returned if the competitor covers the course once and $20 will be returned if he finishes three trial heats. The remaining $5 will be retained to cover timing and administration expenses. Entries are to be in the hands of the committee at least ten days prior to the event and since the first event is planned for December 14, it is evident that only local boats will be able to compete in this first series.

William Wrigley, the new owner of Catalina Island near Los Angeles, has also promised to provide a trophy for the next series of races. These will take place after the winner of the Roach Trophy has been decided.

The course will be a straightaway mile laid out on the Breakwater at Los Angeles. Range marks will be set up so that they will be visible from the inside and outside of the breakwater, affording a course for both smooth and rough water conditions. There will be no question as to the accuracy of this course, as it is to be surveyed by the city surveyor and all the timing is to be done by the aid of electric timing devices. This will insure against any charges of inaccuracy and the times and speed established in this mile will be absolutely correct.

E. Drolet's Buffalo-powered V-bottom runabout

Buffalos in Canada

A satisfied user of Buffalo marine engines is E. Drolet of Montreal. Mrs. Drolet is shown at the wheel of his 23-foot V-bottom runabout which is driven at 16 miles by a 16-20 h.p. Buffalo engine.

Another interesting little boat 24 feet long called Puffin, powered with a Buffalo engine, is on its way to Wrangel, Alaska. This boat was at one time used as tender to Roosevelt in Peary's search for the North Pole. A more complete account of this appears in the last edition of the Buffalo Gasoline Engine Company's booklet, "The Herd."

Display room of Bruns, Kimball & Co. at Philadelphia

Which Is the Champion Runabout?

Many favorable comments on our Racing Articles in the November number of MoToR BoaTinG have been received by us. Everyone seems to agree that the trend of the ideas expressed by all in the articles were along the correct lines and that the greatest season of motor boating activity is due in 1920. This seems to be further emphasized by the notice which has just been received that the British have accepted America's challenge for an International Race in 1920. They have named August 19 as the date for the first race of the series which will be held in protected waters near the Isle of Wight, Eng.

Interest in the race for the Fisher trophy goes merrily on. Manufacturers and sportsmen alike both agree that the greatest impetus was given to the sport by the action taken by the American Power-Boat Association at its annual meeting by barring aviation motors in 1920 from the Fisher race.

A great deal of interesting discussion has started as to which runabout today is entitled to the honor of being our fastest runabout. Mouser III of Chicago, which is credited with better than 40 miles an hour when powered with a Van Blerck motor, claims the championship but this is disputed by Hoosier IV, Nurse, Miss Los Angeles, Heldena II of Toronto, and 'NEverthin' of Detroit. As far as the American Power-Boat Association records are concerned, we repeat again that Kiotta III, now named Heldena II and powered with a Van Blerck motor is champion and Hoosier IV, Sterling powered, is second. However, both records were slightly under that of 36.3 miles an hour made by 'NEverthin', powered with a Hall-Scott motor in a 10-mile race at Detroit this summer.

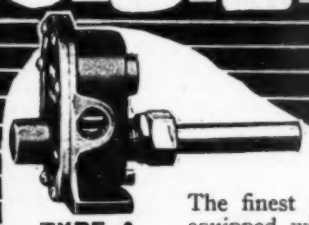
Motors in Philadelphia

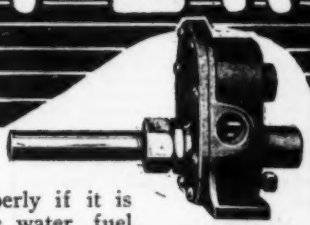
The display rooms of Bruns, Kimball & Co., at Philadelphia as the cut shows, is completely stocked with a full assortment of two- and four-cycle engines. It is questionable if a more complete stock can be found anywhere. Immediate delivery of engines off their sales floor is a common occurrence. One might almost say, "Wrap it up, I'll take this one."

(*Continued on page 72*)

EGYPTIAN
DEITIES
"The Utmost in Cigarettes"
Plain End or Cork Tip
People of culture and refinement invariably PREFER Deities to any other cigarette
30¢
Anargyros
Makers of the Highest Grade Turkish and Egyptian Cigarettes in the World

OBERDORFER PUMPS

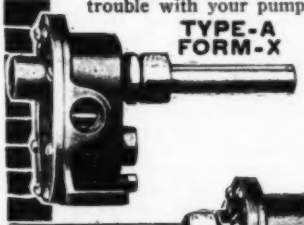




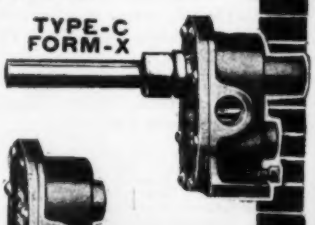
The finest power plant made will not operate properly if it is equipped with an inferior pump, whether it supplies water, fuel or oil.

OBERDORFER BRONZE GEARED PUMPS

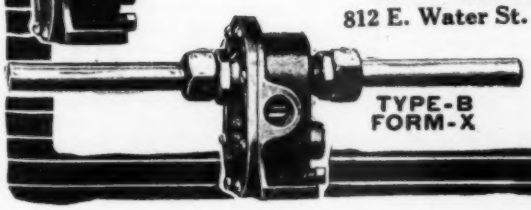
are built especially for marine use—they are made to withstand the hard service encountered in use on board boat—*Oberdorfer Bronze Geared Pumps* are noiseless, automatic, compact and reliable. The supply of water, fuel or oil is governed entirely by the motor—*there is never an over or under supply.* If you have ever had trouble with your pump you will find a world of satisfaction in the trouble-proof Oberdorfer.

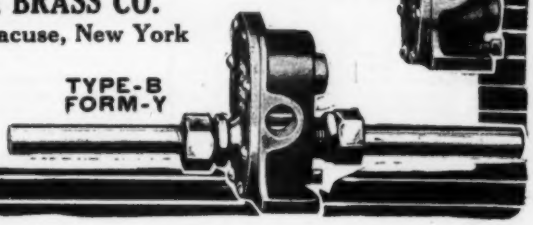


If you own a boat powered with an internal combustion engine you will be interested in our new book on pumps. Your copy is ready for you—it comes *free* on your request.



M. L. OBERDORFER BRASS CO.
812 E. Water St. Syracuse, New York





New Channel and Harbor at Miami Beach, Fla.

By the cutting of a channel 1,000 feet long, 100 feet wide and 12 feet deep from the government channel to the north end of the Gulf Refining Co., dock at Miami Beach, Florida, a harbor of sufficient depth to accommodate yachts of not more than nine feet draft has been created.

This new channel, which has been dug by the Gulf Refining Co. so that company barges can be brought to the dock, connects with what is known as the speedboat race course on which Carl G. Fisher annually holds a regatta. This course lies along the west shore of Miami Beach, is practically two miles long and more than half a mile in width. It is virtually landlocked, thus affording safe anchorage under all conditions. Miami, across the bay, is easily accessible from this anchorage.

The course is entered from the government channel immediately it emerges through the peninsular on the bay side and leads north along the seawall, or bulkhead. The channel is staked and lighted on the port entrance side. Ultimately this channel and race course will be dredged to a depth of 20 feet, while a great yachting basin will be laid out and maintained by Mr. Fisher at the upper end of the course.

The city of Miami Beach, Mr. Fisher and residents of Miami Beach in general, invite all yachtsmen, especially those going on and returning from cruises in southern waters, to stop in and enjoy the freedom of the port.—Adv.

SALE BY THE NAVY
OF
DESTROYERS, YACHTS, GUNBOATS, MONITOR

There will be sold by sealed proposals receivable at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12:00 o'clock noon, 29 December, 1919:

Yacht EAGLE, Gunboat ISLA DE LUZON, now in the First Naval District, Navy Yard, Boston, Mass.

Yacht AILEEN, now in the Third Naval District, Brooklyn, N. Y.

Destroyers BAINBRIDGE, BARRY, DALE, DECATUR, HOPKINS, HULL, LAWRENCE, PAUL JONES, PERRY, PREBLE, STEWART, TRUXTON, WHIPPLE WORDEN; Monitor AMPHITRITE, now in the Fourth Naval District, Navy Yard, Philadelphia, Pa.

Gunboat YANTIC, now in the Ninth Naval District, Naval Training Station, Great Lakes, Ill.

Exact location may be ascertained from the Commandant of the district concerned, and should be obtained before making trip for inspection. Sales will be for cash to the highest bidders. Right to reject all bids reserved. Forms of proposal, information concerning the vessels, and the terms of sale, obtainable from the bureau of Supplies and Accounts, or Commandants of the above districts. JOSEPHUS DANIELS, Secretary of the Navy. 11-24-19

What Were the Faults of the Subchasers

(*Continued from page* 64)

further details of their shortcomings. Ventilation, water-tightness, and fire risk are not by any means new topics for discussion, but the fact that in the chasers there was so much room for improvement along these lines would indicate that their importance has not yet been fully realized. When the perfect hull is evolved it will balance these essentials in nice ratio to speed, seaworthiness, convenience, and comfort—but it is to be doubted whether any two critics will agree on the achievement of the perfect hull.

Marking according to the Navy scale of 4, wherein a grade of 2.5 is necessary for passing, I should rate the submarine chaser as follows: Ventilation, 2.4; tightness (bottom) 3.8; (decks) 2.3; speed, 3.2; convenience, 3.1; and seaworthiness, 4. No mark can be given under the heading comfort, for, as has been implied, it was nil; and the chaser was, moreover, a war vessel intended not for the pursuit of happiness but of submarines.

Open and Closed Circuit Battery Ignition

(*Continued from page* 32)

the switch is "ON" and is broken at the proper interval to produce the spark. The additional current used by this type of ignition is a matter of small consequence as the electric generator is constantly supplying the storage battery as long as the engine is running.

The typical Closed Circuit consists of a *contact-maker*, a *distributor* and an *induction coil*. The location for the *condenser* is on the contact-maker but a few of the older type systems still incorporate it with the coil.

Fig. 7 shows the construction of a typical closed-circuit contact-maker. The composition fibre tip of the contact arm (A) rests on the camshaft (B) which has a lobe for each cylinder. Each time that the contact arm is raised by a lobe on the camshaft, the contact points open and a spark occurs at the proper plug.

The primary current is "stepped up" by the coil exactly as in the Open Circuit system.

The distributor (Fig. 6) is also used as a cover for the contact-maker and conveys the high-tension current to plugs. This distributor is also used on the open-circuit and systems.

The wiring connections (Fig. 5) show clearly the complete operation of a Closed Circuit ignition system.

This type of battery ignition has even fewer moving parts than the Open Circuit type and is equally easy to adjust and lubricate. Its spark is independent of engine speed facilitating easy starting and protecting the contact points against destruction by excessive current.

For ease in starting and economical operation, battery ignition is far superior to any other system at present on the market. Whether Open Circuit or Closed Circuit is to be used depends entirely on the individual engine. The growing use of electric starting and lighting indicates an increase in the number of closed circuit systems. All engines not electrically equipped will, in all probability, continue to use dry cell, Open Circuit ignition on account of its cheapness, reliability and simplicity.

Advertising Index will be found on page 156

SALE BY THE NAVY
Of YACHTS, MOTOR BOATS, ASH LIGHTER, and STEVEDORING BARGES

There will be sold by sealed proposals, receivable at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12:00 o'clock noon, 29 December, 1919:—

Yachts CIGARETTE S. P. 1234, ADELANTE S. P. 765; Motor Boats AKBAR S. P. 599, EUPHEMIA S. P. 539, VALEDA S. P. 592, STEVEDORING BARGES No. 43, No. 44 and No. 45, now in the First Naval District, Navy Yard, Boston, Mass.

Motor Yacht KEMAH S. P. 415, now in the Third Naval District, Brooklyn, N. Y.

Ash Lighter No. 53 S. P. 3262, now in the Fifth Naval District, Naval Operating Base, Hampton Roads, Va.

Motor Boat ALTHEA S. P. 218, now in the Ninth Naval District, Naval Training Station, Great Lakes, Ill.

Motor Boat BAY OCEAN S. P. 2640, now in the Twelfth Naval District, Sheldon Bldg., San Francisco, Calif.

Exact location may be ascertained from the Commandant of the district concerned, and should be obtained before making trip for inspection. Sales will be for cash to the higest bidders. Ten per cent deposit required with bid. Right to reject all bids reserved. Forms of proposal, information concerning the vessels, and the terms of sale, obtainable from the bureau of Supplies and Accounts, or Commandants of the above districts. JOSEPHUS DANIELS, Secretary of the Navy. 11-24-19

SALE BY THE NAVY
OF
SUB-CHASERS, YACHTS and SEA SLED

There will be sold by sealed proposals, receivable at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12:00 o'clock noon, 29 December, 1919:

Sub-Chasers No. 434 and No. 418, now in the Third Naval District, Fleet Supply Base, Brooklyn, N. Y.

Yacht WINCHESTER S. P. 156, Sea Sled ITTY E, S. P. 952, now in the Fifth Naval District, Navy Yard, Norfolk, Va.

Sub-Chasers No. 337, No. 201 and No. 200, now in the Sixth Naval District, Navy Yard, Charleston, S. C.

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11-22-19 Secretary of the Navy.

HALL-SCOTT

H S

To further emphasize the Supremacy of Hall-Scott Motors, "Miss Los Angeles", Dustin Farnum's Hacker-built 28-foot Runabout, powered with a six-cylinder 200 H.P. Hall-Scott Marine Motor, won the famous

NORDLINGER TROPHY

emblematic of the Pacific Coast Displacement Championship, not only shattering all existing records by averaging 36.3 miles an hour for the three 24-mile races, but also taking down five other Cups for good measure, including the Cup for

CONSISTENCY

In the three heats of twenty-four miles each, Miss Los Angeles' time varied only 53 seconds.

AVERAGE SPEED FOR 72 MILES BETTER THAN 36 3/10 MILES AN HOUR.

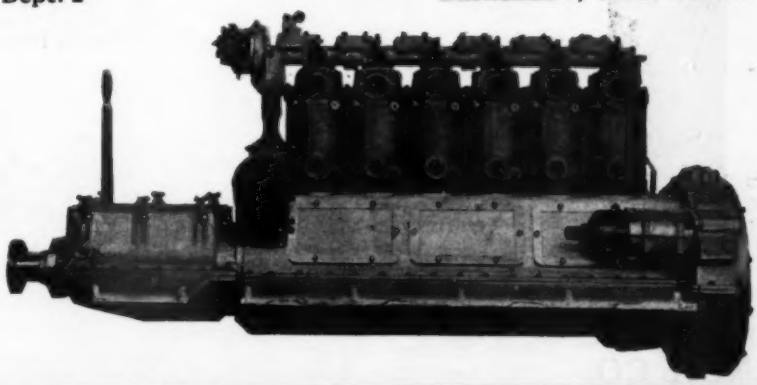
"Kenupshau", a Sea Sled, powered with two four-cylinder 125 H.P. Hall-Scott Marine Motors, finished a good second in all three races, never more than 24 seconds behind the winner.

The performance of Miss Los Angeles in California merely repeated the record of N'Everthin', a duplicate both in hull and power plant, which made 36.3 miles per hour, timed by A. P. B. A. officials, at the Detroit races in September.

Write for a copy of the new Hall-Scott Catalog.

HALL-SCOTT MOTOR CAR CO., INC.

Dept. 2 **BERKELEY, CALIFORNIA**



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The wiring connections (Fig. 5) shows clearly the complete operation of a Closed Circuit ignition system.

This type of battery ignition has even fewer moving parts than the Open Circuit type and is equally easy to adjust and lubricate. Its spark is independent of engine speed facilitating easy starting and protecting the contact points against destruction by excessive current.

For ease in starting and economical operation, battery ignition is far superior to any other system at present on the market. Whether Open Circuit or Closed Circuit is to be used depends entirely on the individual engine. The growing use of electric starting and lighting indicates an increase in the number of closed circuit systems. All engines not electrically equipped will, in all probability, continue to use dry cell, Open Circuit ignition on account of its cheapness, reliability and simplicity.

Advertising Index will be found on page 156

SALE BY THE NAVY
Of YACHTS, MOTOR BOATS, ASH LIGHTER, and STEVEDORING BARGES

There will be sold by sealed proposals, receivable at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12:00 o'clock noon, 29 December, 1919:—

Yachts CIGARETTE S. P. 1234, ADELANTE S. P. 765; Motor Boats AKBAR S. P. 599, EUPHEMIA S. P. 539, VALEDA S. P. 592, STEVEDORING BARGES No. 43, No. 44 and No. 45, now in the First Naval District, Navy Yard, Boston, Mass.

Motor Yacht KEMAH S. P. 415, now in the Third Naval District, Brooklyn, N. Y.

Ash Lighter No. 53 S. P. 3262, now in the Fifth Naval District, Naval Operating Base, Hampton Roads, Va.

Motor Boat ALTHEA S. P. 218, now in the Ninth Naval District, Naval Training Station, Great Lakes, Ill.

Motor Boat BAY OCEAN S. P. 2640, now in the Twelfth Naval District, Sheldon Bldg., San Francisco, Calif.

Exact location may be ascertained from the Commandant of the district concerned, and should be obtained before making trip for inspection. Sales will be for cash to the higest bidders. Ten per cent deposit required with bid. Right to reject all bids reserved. Forms of proposal, information concerning the vessels, and the terms of sale, obtainable from the bureau of Supplies and Accounts, or Commandants of the above districts. JOSEPHUS DANIELS, Secretary of the Navy. 11-24-19

SALE BY THE NAVY
OF
SUB-CHASERS, YACHTS and SEA SLED

There will be sold by sealed proposals, receivable at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12:00 o'clock noon, 29 December, 1919:

Sub-Chasers No. 434 and No. 418, now in the Third Naval District, Fleet Supply Base, Brooklyn, N. Y.

Yacht WINCHESTER S. P. 156, Sea Sled ITTY E, S. P. 952, now in the Fifth Naval District, Navy Yard, Norfolk, Va.

Sub-Chasers No. 337, No. 201 and No. 200, now in the Sixth Naval District, Navy Yard, Charleston, S. C.

Exact location may be ascertained from the Commandant of the district concerned, and should be obtained before making trip for inspection. Sales will be for cash to the highest bidders. Ten per cent deposit required with bid. Right to reject all bids reserved. Forms of proposal, information concerning the vessels, and the terms of sale, obtainable from the Bureau of Supplies and Accounts, or Commandants of the above districts. JOSEPHUS DANIELS, 11-22-19 Secretary of the Navy.

HALL-SCOTT

H S

To further emphasize the Supremacy of Hall-Scott Motors, "Miss Los Angeles", Dustin Farnum's Hacker-built 28-foot Runabout, powered with a six-cylinder 200 H.P. Hall-Scott Marine Motor, won the famous

NORDLINGER TROPHY

emblematic of the Pacific Coast Displacement Championship, not only shattering all existing records by averaging 36.3 miles an hour for the three 24-mile races, but also taking down five other Cups for good measure, including the Cup for

CONSISTENCY

In the three heats of twenty-four miles each, Miss Los Angeles' time varied only 53 seconds.

AVERAGE SPEED FOR 72 MILES BETTER THAN 36 3/10 MILES AN HOUR.

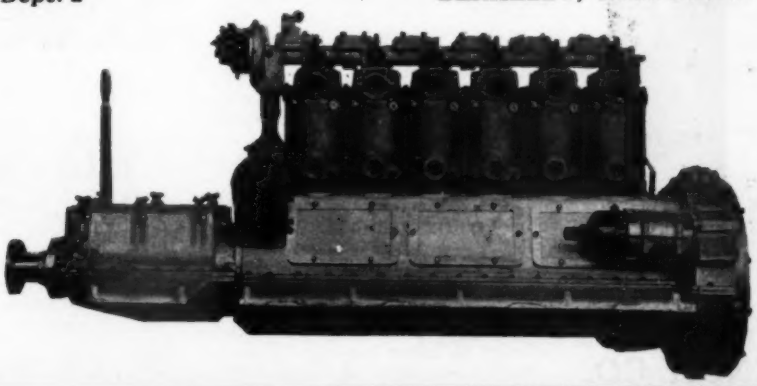
"Kenupshau", a Sea Sled, powered with two four-cylinder 125 H.P. Hall-Scott Marine Motors, finished a good second in all three races, never more than 24 seconds behind the winner.

The performance of Miss Los Angeles in California merely repeated the record of N'Everthin', a duplicate both in hull and power plant, which made 36.3 miles per hour, timed by A. P. B. A. officials, at the Detroit races in September.

Write for a copy of the new Hall-Scott Catalog.

HALL-SCOTT MOTOR CAR CO., INC.

Dept. 2 **BERKELEY, CALIFORNIA**



H S

"TRADE MARK"
COES
REG. U.S. PAT. OFF.

Wrenches Deliver 30% More Service for 5% Greater Cost

Why buy a substitute or an imitation?

AT ALL RELIABLE HARDWARE STORES

COES WRENCH CO.
WORCESTER, MASS.

Separate Cockpit for the Operator

(*Continued from page* 48)

about five. With this in mind, we may begin to lay out the seating arrangement. It may be well, also, to keep in mind the fact that the boat will be used mostly by the family, so that there should be room for five, but accommodations for a few more if necessary.

Now let us look at the illustration. Directly behind the engine compartment there are two seats from one of which the boat is controlled. Across the rear of the cockpit there is a straight seat, capable of holding three persons comfortably. This layout of the cockpit gives ample room for a family of five.

Now for the extra seats. Just in front of the engine we have a cockpit containing a seat, roomy enough for three. When not in use, this compartment is entirely hidden under a flush hatch. This seat not only gives more room, but also distributes the weight more evenly.

There are now eight seats. If two or three more are needed, folding chairs are set up in the rear cockpit. These can easily be carried under the hatch in front of the forward cockpit.

With a good motor and cushioned seats a boat like the one described would be surely speedy, good looking and comfortable.

G. S. M., Jr.,
Mamaroneck, N. Y.

Yard & Shop

(*Continued from page* 66)

Thos. Fleming Day, Inc., Branches Out

A new yacht brokerage department has recently been added to the activities of Captain Day. Under the command of Carlton T. Bradley, he has embarked on this new venture with a full cargo of all sorts; cruisers, runabouts, schooners, sloops. A full list will be given to all who desire it.

Air Compressors

The Black & Decker Mfg. Co. have moved their general offices from Baltimore to Towson Heights, Md., where a new and larger plant is being built and is well under way.

The additional space is required to provide increased output of Electric Valve Grinders, which are being used by marine engine manufacturers and service agencies. Portable electrical drills and tools with the Pistol Grip and Trigger Switch are also manufactured in large variety.

Their Lectroflater is useful on board yachts fitted with electric service for storing air for whistle purposes. All tools and pumps are built to operate on 32 volts or 110 volts and practicable for use on shipboard.

(*Continued on page* 72)

Advertising Index will be found on page 156

Baldridge Reverse Gear

has every good feature that any good reverse gear has—and then some.

THE BALDRIDGE is a clean gear. Its perfect enclosure keeps all grease in the gear where it belongs.

THE BALDRIDGE will work for you a long, long time. Salt water cannot get in and rust out its parts.

THE BALDRIDGE unbroken mainshaft absolutely prevents your gear from sagging and getting out of alignment.

Immediate deliveries are now possible if you act quick.

Send for booklet, "For the Man in the Boat"—Free.

The reverse speed is 66⅔% of the forward speed.

The Baldridge Gear Co.
Boston, Mass.

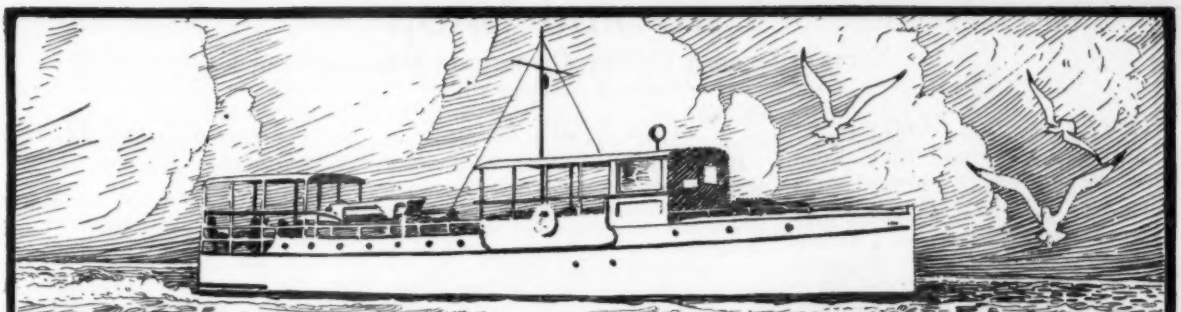
SCORED CYLINDERS
Repaired without regrinding by the
Lawrence Patent Process
Scores and defects filled with a silver-nickel alloy electrically fused, and refinished equal to new.
Write for details. Shop licenses are available
L. Lawrence & Co. WOOLWORTH BLDG. NEW YORK CITY
Service Plants in the principal automobile centers

WOOLSEY COPPER PAINTS
and Marine Paint Specialties are the World's Standards. Send for free booklet "How to Paint a Boat."
C. A. Woolsey Paint & Color Company, Jersey City, N. J., U. S. A.

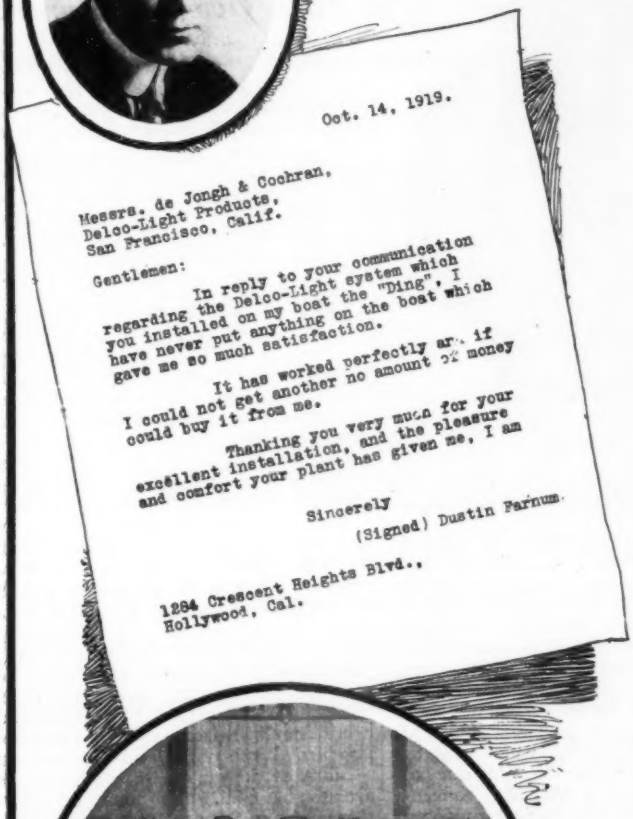
ANDERSON ENGINES ARE GOOD ENGINES
MADE IN CHICAGO, U.S.A.
By The Anderson Engine Co.

Preservo
Trade Mark Registered
Waterproofs and Preserves Canvas. ROBESON PRESERVO COMPANY Port Huron, Mich.
Eastern Branch: 357 Western Ave., Boston, Mass.
Canadian Branch: Sarnia, Ont.
THE HUNTER-JOHNSON CO., 209 California St., San Francisco, Cal.
Distributors for Pacific Coast

DREADNAUGHT SAFETY SUIT
for SAFETY, UTILITY and PLEASURE
Great for Duckshooting and Fishing
Kapok Swimming Belts and Canoe Cushions, $2.25 each.
Adjustable Kapok Jacket, $12.00.
SAFETY-AT-SEA CORPORATION
1358 Broadway New York



DELCO-LIGHT



Oct. 14, 1919.

Messrs. de Jongh & Cochran,
Delco-Light Products,
San Francisco, Calif.

Gentlemen:

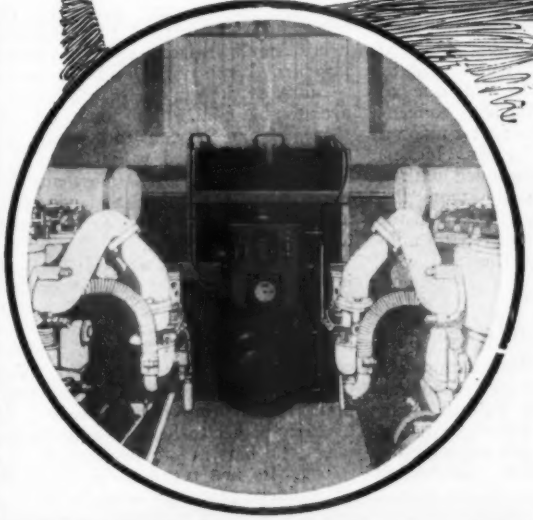
In reply to your communication regarding the Delco-Light system which you installed on my boat the "Ding", I have never put anything on the boat which gave me so much satisfaction.

It has worked perfectly and if I could not get another no amount of money could buy it from me.

Thanking you very much for your excellent installation, and the pleasure and comfort your plant has given me, I am

Sincerely
(Signed) Dustin Farnum.

1284 Crescent Heights Blvd.,
Hollywood, Cal.



DUSTIN FARNUM, known to fame through both stage and screen, is owner of the cruiser "Ding."

An excellent boat, fast enough for any man's wish, large enough for the entertainment of one's friends, and *luxuriously appointed throughout.*

And of course a part of this luxury comes from the Delco-Light Marine Set. Cabins, staterooms, engine rooms, galley and bridge are all lighted with electricity. Electric sailing lights and a powerful search light, too. In fact, the same conveniences of electric light and power that Mr. Farnum enjoys in his home on land.

These conveniences are always available—on cruise or when lying in port for days at a time—because the Delco-Light Marine Set is independent of the main engines.

Your boat, regardless of size or type, can be easily equipped with the Delco-Light Marine Set. Write for the "Motor Boat Booklet" and we'll tell you how.

The Domestic Engineering Co.

DAYTON, OHIO

There are Delco-Light Distributors in all important lake and ocean ports.

Yard and Shop

Notes of Interest to Both Owner and Manufacturer

(*Continued from page 66*)

International Thirty-two

MoToR BoatinG has often said that some day we would be able to buy a cruiser just as we do an automobile. Today this is true, for here we have the International Thirty-two, a 32-foot raised-deck cruiser, 9 feet beam, 36 inches draft, with full headroom, a roomy cabin, large cockpit, a four-cylinder Kermath motor giving 10-mile speed, completely equipped and ready for use.

The International Shipbuilding and Marine Engineering Corp., Nyack, N. Y., are beginning production of the first series of these cruisers and Wm. J. Deed, Jr., formerly of Boston, now naval architect for the International Corporation, pronounces them the best ever. A bridge-deck cruiser of the same general dimensions is also in preparation. It is expected to show these boats at the Motor Boat Show in February.

Oberdorfer Expands

Owing to the large increase in export business noticeable recently, the M. L. Oberdorfer Brass Co., of Syracuse, N. Y., have found it necessary to increase their facilities. It is intended to double the capacity of the present plant, which it is hoped will be sufficient to take care of the increasing demand for small pumps for some time to come.

These pumps have been manufactured for many years, but the volume of sales in the year just closing has been three times greater than any previous year. Many of the best-known marine motors are now equipped with Oberdorfer pumps as standard. Among these are Lathrop, Red Wing, Kermath, Freeman, Gray, and others.

Magic Spark Plug Cleaner

For those who are troubled with dirty spark plugs the Champion Spark Plug Co., of Toledo, O., have brought out a neat little device to simplify the work of cleaning them. Before the advent of this cleaner it was a day's work to properly clean the plugs on a six-cylinder engine. The Minute Cleaner will accomplish in a few minutes what formerly took an hour or two. Better yet, this can all be accomplished without soiling the hands.

A heavy molded glass tube 6 inches long, one end being open and fitted with a rubber bushing into which the spark plug is screwed is all there is to it. Inside the tube are fifty hardened steel needles that serve as carbon removers.

Auto Spark-Lite

Before the anti-tobacco folks kill smoking, you might as well enjoy yourself as much as possible. The Auto Spark Lite is a little device designed particularly to facilitate lighting your favorite brand on the windy bridge or cockpit of your motor boat. By means of an extension cable from your high-tension ignition circuit current is brought to the lighter and used to ignite the gasoline in the torch. The device is neat, practical and ornamental as well as filling a real need for the smoker.

Auto Spark-Lite with torch for cigar lighting

Hacker Boat Co., Inc.

Another new corporation in the motor boat world—J. L. Hacker and Lieut. H. F. Palmer have joined forces as president and secretary-treasurer of the Hacker Boat Co., Inc. Both of these gentlemen have been associated with the development of high-speed boats for many years and their earlier plans were interrupted by the war. An entirely new plant is being built at Mount Clemens, Mich., which will be used together with the old one at Detroit. Attention will be concentrated on the 26- and 30-foot runabout models newly designed by Mr. Hacker.

One of these boats equipped with a Hall-Scott motor recently won the Nordlinger Trophy for Mr. Dustin Farnum at Los Angeles in a 70-mile race. In this same race the boat won five other cups also.

Joe Petrelli Moves

Navy Gear Mfg. Co., Inc., announces the occupation of their new plant at Portchester, N. Y. Joe Petrelli, gear expert has felt the need for expansion and this new factory is the outcome of this desire for more room. Interested readers are advised to send for specifications of the Navy Gear.

New Channel and Harbor at Miami Beach, Fla.

Attention is called to the item on page 68, which describes the new channel and harbor available for motor boats and yachts at Miami Beach, Fla., the winter home of Carl G. Fisher, the well-known motor boat speed enthusiast. Northern boat owners who are spending the winter in Florida will find this new harbor an added attraction to the already ideal boating facilities of the Florida Coast.

Dodge Manufacturng Co. Takes Over Oil Engines

Confirmation has been received from the Dodge Manufacturing Co., Mishawaka, Ind., to the effect that they have recently taken over the Burnoil Engine Company. The Dodge organization is famous for its large output of transmission machinery and appliances and a new plant is being equipped at the Dodge Works, which will be devoted exclusively to the production of Burnoil heavy-oil engines.

Navy Selling Many Motor Boats

Many attractive motor boats and yachts, together with numerous other vessels suitable for commercial service are being offered for sale by the Navy Department. The Paymaster General of the Navy is operating a mail order business in motor boats and yachts.

The terms of sale are lenient, a 10 per cent. deposit being required with the bid. This can take the form of a certified check, cash or Liberty bonds, the balance being payable at a later date.

Large numbers of the boats already sold by the Navy have been restored to pleasure service and many of them have been converted to commercial needs, small cruisers, and gunboats being turned into ocean and lake vessels.

Many of the famous 110-foot chasers are to be sold. The cost of these varies from $25,000 to $80,000 each and their appraised value today is far below their first cost. They are fitted with three 220 h.p. Standard engines and can be converted into almost any desired type of vessel.

Many other boats are constantly being offered for sale and in order to obtain an opportunity to bid on these vessels, those interested should write to the Bureau of Supplies and Accounts, Navy Department, at Washington, D. C., and they will be placed upon the mailing list to receive data of each vessel to be sold and the time when the bids are to be opened.

Deposits are returned to unsuccessful bidders promptly, usually within a week. (*Continued on page 74*)

PETERS' CRANK-SHAFT GRINDER

PAT'D ON BASIC PRINCIPLE—OTHER PATS. PENDING.

A NECCESSARY PART of the Equipment of Every Motor Repair Shop for TRUING EGG-SHAPED CRANK PINS.

SHOWING HOUSING SPLIT FOR PLACEMENT ABOUT THE CRANK-PIN

DESCRIPTION OF GRINDER

Peters' Crankshaft Grinder consists of a chuck-like housing made of Aluminum. The housing is split and hinged to allow the tool to go around the pin, thereby eliminating any centering. The Grinder is operated by means of a screw plate moving all the cutters to and from the center universally, by one operation of spanner wrench. The tool can be operated on connecting-rod pins on most large engines without removing the crank shaft. Accomplishes the work in one-fifth the time ordinarily required by the old method and without the aid of skilled labor.

FULLY GUARANTEED

***Price* $75.00**

A VISE AND BLOCK COMPLETES THE EQUIPMENT

F. O. B. Factory—Philadelphia, Pa.

PETERS' METALLIC FILLER

!! WORKS AT 300° F. !!

FORMS A PERMANENT, WEAR RESISTING BRAZE

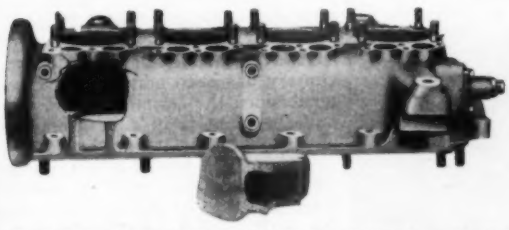
FOR CRACKED IRON, BRONZE AND BRASS CASTINGS

Price $5.50 Per lb.
$3.00 " ½ "
F. O. B. Factory

NO DANGER OF WARPED OR DISTORTED CASTINGS. PERFECT ALIGNMENT RETAINED

PETERS' ALUMINUM BRAZING SOLDER

GUARANTEED NON-OXIDIZING— THE REPAIR WILL LAST THE LIFE OF CASTING.



Typical Repairs Made Possible with Peters' Aluminum Brazing Solder

Price
$3.50
Per Lb.
F. O. B. Factory

A Pound of Peters' Aluminum Brazing Solder, at $3.50, is Good for at Least $25 Worth of Repair Work. It is Easy Work—and Quick

ALUMINUM BRAZING SOLDER CO.

WIDENER BUILDING
PHILADELPHIA, PA. U.S.A.

Yard and Shop

Notes of Interest to Both Owner and Manufacturer

(*Continued from page 72*)

Leak-Proof Boats

Have you ever bailed a leaky boat? You can avoid this drudgery excepting of course the rain from above, if you make your boat leak-proof. Your boat is bound to be leaky particularly if you hang an outboard motor over the transom unless you take steps to make it leak-proof. Jeffrey's Black Marine Glue No. 7 or Special Marine Canoe Glue when properly applied will make any boat absolutely and permanently leak-proof. Other useful glues are also made especially for marine use. Some for deck and hull seems, others for use with canvas on decks and many other purposes. To obtain satisfactory results it is essential that the correct variety be used for the job in hand.

A Good Strainer

Colador strainer with large area

The Colador Engineering Company are introducing a strainer which is a real serviceable strainer. This device developed particularly for marine work has very large straining areas and traps that are large enough to catch and hold any sediment and water. The body is made of cast metal and if necessary an extra strainer basket can be carried. The good points claimed for this strainer are accessibility of strainer basket, facility of cleaning, scientifically correct straining area, large trap for accumulated water and sediment, and provision for supporting the strainer.

There are two sizes of Colador for marine use, one with 7 and the other with 10¾ square inches of strainer area, tapped for ¼-inch and ⅜-inch pipe size, respectively.

Matthews Light in Siam

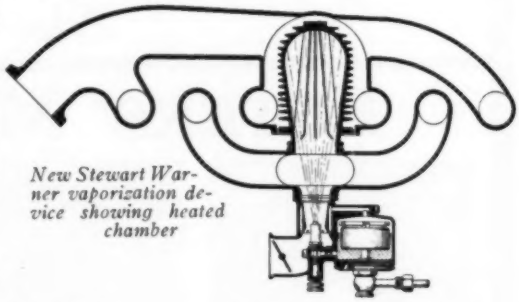
The King of Siam has recently purchased a 5 K.W. Matthews full automatic electric light and power plant for use in the royal palace. The same plant that is satisfactory to the advisers of the King is available to the common citizen also. Particularly for motor boatmen, small plants from 1/3 k.w. capacity up are made to supply the demand for electricity on the motor boat and yacht. These outfits are full automatic and require no attention other than fuel and oil. They will keep the battery installation properly charged at all times, thus insuring a continuous supply of electricity always on tap.

Van Blercks for China

Guy W. Vaughan, that bustling and progressive vice-president and general manager of the Van Blerck Motor Company, made a hurry-up jump to New York from Monroe, Mich., a few days ago. It is reported that as the result of his day's labors he landed an order for $33,000 worth of Van Blerck engines to be shipped to China and to be used in Chinese motor boats employed for chasing pirates and smugglers in the waters around the Chinese Republic. The motors are regular four-, six-, and eight-cylinder Van Blerck models and will be equipped to operate on kerosene.

New Fuel System

For those who prefer to use low-grade fuels, the Stewart Warner Speedometer Corporation has perfected an advanced method of carburetion, which operates well on all grades of gasoline, alcohol, kerosene, and distillates.



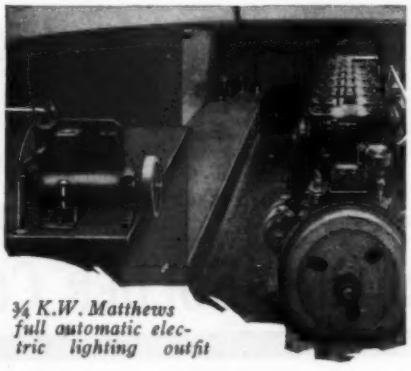
New Stewart Warner vaporization device showing heated chamber

The fuel is finely divided mechanically at the spray nozzle of the carbureter. Extremely high air velocities are impressed on the fuel globules which causes them to leave the air stream and impinge on the heated vaporizing chamber. As the heated vapor leaves the chamber it gives up some of its heat to the air stream, the resulting mixture temperature being far below that of a mixture formed by heating the whole charge and is the minimum possible to insure a charge of perfect quality.

By means of this fuel system the charge temperature remains constant under all conditions from idling to full speed. The only change occurs when the fuel ratio is changed.

Betsy Ross Flags

The Betsy Ross Flag Co. Inc., Newburgh, N. Y., have just issued a neat little price index of their various flag products. Their flags, life belts, life preservers, cushions, etc., are all listed for ready reference.



¾ K.W. Matthews full automatic electric lighting outfit

Old Glory to Have a J.V.B.

One of the first to order a new J.V.B. engine for his boat is G. P. P. Bonnell, builder of the famous series of Old Glories. The sale was consummated in a very few minutes when Mr. Bonnell happened to meet Nick Rost in New York one day not so long ago. During the conversation it developed that Old Glory was due for a new machine and in a very few minutes, Nick Rost had his signature on the dotted line. The engine, one of the 28-38 h.p. type, will be completely equipped as are all J.V.B. engines.

Oil-Burning Marine Engine

The Quayle oil-burning engine of 25-30 horsepower is now being produced on a quantity basis at the plant of the Commonwealth Motors Company. Considering the difficulties in securing materials of a quality necessary for such an engine this serves to show the aggressiveness of the company. This engine is a heavy-duty internal combustion engine of medium weight and operates on the Hvid principle. The company will soon be in a position to accept considerable domestic business as well as to take care of its increased export business.

Ball Bearings in Gears

The Carlyle-Johnson Machine Co., of Manchester, Conn., have been manufacturing ball bearing, reverse gears for the last fifteen years. Their product is simplified and refined to a high degree, being completely enclosed.

A large amount of new modern machinery has been added to their equipment since the termination of the war and the plant is in a position to meet any demand for its product.

Through the use of alloys, steels, and ball bearings, this gear is enabled to transmit more of the engine power to the shaft. High-speed and heavy-duty installations are all being equipped with Johnson Gears, which stand up well under the heavy strains imposed. A price list and information will be mailed to any MoTor BoatinG readers on request.

(*Continued on page 76*)

Truth in Advertising

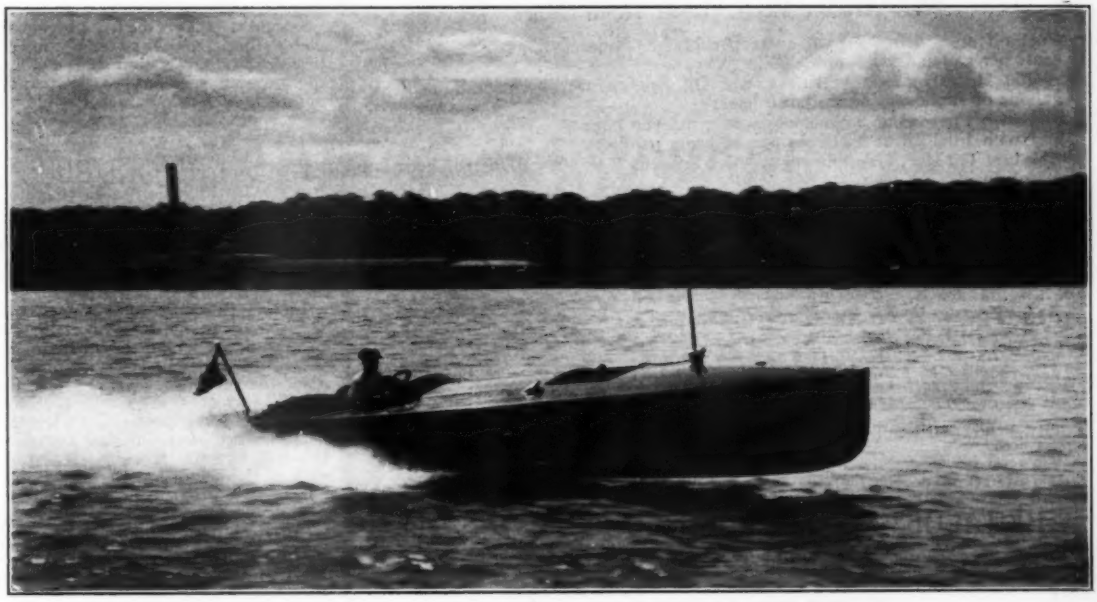
What we tell you in words we will make good with works

JOHN L. HACKER, N. A.
HUGH F. PALMER, *Mgr.*

Hacker-Craft

RUNABOUTS EXCLUSIVELY

"The News Items of the Day Tell You of Our Successful Boats"



Everybody knows the "N'Everthin" which made a new displacement boat record, A. P. B. A. official, 36.3 miles per hour average for 10 miles. She takes along with her a Hall-Scott L. M. 6-cylinder motor to help her on her way. A sister boat, Miss Los Angeles, won the Nordlinger cup and several others, under the skilful piloting of her owner, Mr. Dustin Farnum.

HACKER BOAT COMPANY

323 Crane Avenue

WRITE TO US **Detroit, Mich.** ***WRITE TO US***

FACTORIES AT

Mount Clemens and Detroit

Would You Throw Money Overboard?

Not If You Knew It!

But That's What You're Doing If You Are Using a Gasoline Engine to Drive Your Tug, Fishing Boat or Other Work Boat.

Here Are the Facts. Look Them Over:

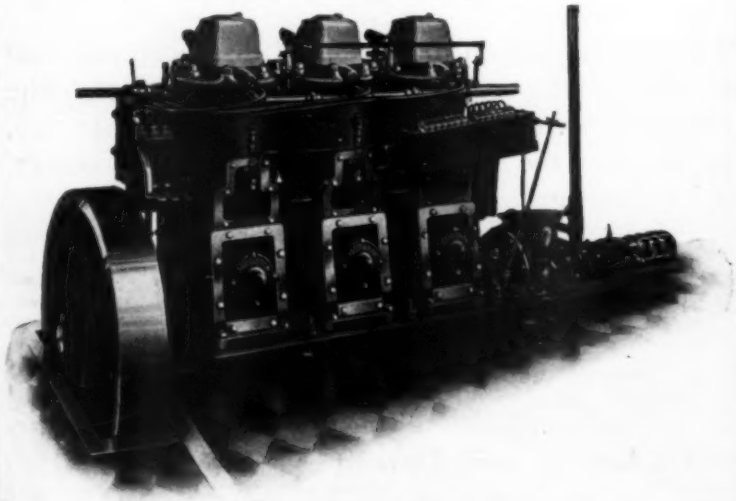
Fuel oil costs from 3 to 8 cents per gallon against an average of 30 cents per gallon for gasoline.
A 100 H.P. Jacobson Marine Crude Oil Engine uses between 8 to 10 gallons of fuel every hour at full load;
and with Fuel oil at 3 cents costs 30 cents per hour
and with Fuel oil at 8 cents costs 80 cents per hour
The best 100 H.P. Gasoline engine uses between 8 to ten gallons per hour at full load.
Gasoline at 25 cents costs $2.50 per hour
Money saved when using fuel oil.
When Fuel Oil costs 3 cents per gallon $2.20 every hour
When Fuel Oil costs 8 cents per gallon 1.70 every hour
and on other sizes as much in proportion.

Ask Yourself These Questions:

CAN I AFFORD TO KEEP ON RUNNING MY GASOLINE ENGINE?
HOW LONG WILL IT TAKE ME TO SAVE THE COST OF A JACOBSON OIL ENGINE BY THE SAVING IN FUEL COST?
STOP THROWING MONEY OVERBOARD.
USE THE JACOBSON MARINE CRUDE OIL ENGINE.

THE FIRST THING TO DO is to WRITE for specifications and price on the size you need.
You'll get our catalog, specifications and prices by the first mail.
Don't forget to mention the size engine you want.

THE JACOBSON GAS ENGINE CO., MANUFACTURERS
ALBANY, N. Y., U. S. A.
or The Jacobson Engineering Co., Inc., Export Dept.
30 Church Street, New York, U. S. A.



Will America Bring the Trophy Back?

(*Continued from page* 9)

mobile club in any country is entitled to challenge for the trophy, or enter a boat for its defence. The challenges are sent to the Royal Motor Yacht Club of Great Britain and a copy of the challenge sent to the recognized club of its own country. If more than three challenges or entries are received from the same country, then the recognized club of that country shall hold elimination races or trials in order to select a team of three boats to represent its country.

The races must be held over a suitable course in sheltered waters of the country holding the trophy. The length of the course is to be not less than 25 or more than 35 nautical miles, and the length of each round shall be not less than 5 or more than 8 nautical miles. The length of the competing boats is limited to 40 feet overall and each boat must be fitted with mechanical power and reversing devices which will drive her astern at a speed not less than 4 knots. Each boat entered as one of a team must start in every heat before the winning boat completes the course and must finish each heat within three hours of the finish of the winning boat. A boat which fails to so start or finish is not eligible to start in the next heat.

Yard and Shop

(*Continued from page* 74)

Hall-Scott to Establish an Eastern Sales Branch

The Hall-Scott Motor Car Co., builders of the famous Hall-Scott marine motors announce that they will open up a New York sales and service office shortly after the first of the year. John G. Robinson, formerly sales manager for the John L. Hacker Boat Co., of Detroit, will be in charge of the marine department of this office. Mr. Robinson is at present visiting the factory at Berkely, Cal.

Miss Los Angeles, the Hacker Runabout of Dustin Farnum's, is powered with a Hall-Scott six-cylinder 200 h.p. marine motor and succeeded in winning most of the prizes at a recent regatta at Los Angeles.

Busy Ship Chandlery

E. J. Willis, president of the E. J. Willis Co., pioneer of the motor boat and yacht supply houses in the United States, is never too busy to give his personal attention to every inquiry of any description pertaining to the motor boat industry. Mr. Willis, who is considered an authority on motor boat and ship chandlery, says that never before has he been so optimistic and looked forward to such a brilliant season as 1920 promises to be. We had the pleasure of visiting Mr. Willis and were astounded to see the hundreds of orders and inquiries he is receiving from every country in the world. To meet the unprecedented demands, the E. J. Willis Co. have today the largest stock of motor boat hardware in addition to their complete line of automobile accessories in the United States. Mr. Willis informs us that their new 1920 catalog is ready for mailing, and notwithstanding the ever-increasing cost of all commodities, the E. J. Willis Co. is in a position to sell the highest quality supplies at lower prices than in the past.

(*Continued on page* 78)

Advertising Index will be found on page 156

TOPPING BROTHERS

MARINE HARDWARE OF EVERY DESCRIPTION

Shipbuilding Supplies — Cabin Hardware — Cargo, Boom and Mast Fittings

PORT LIGHTS ALL DESIGNS AND SIZES

Calking Irons
Ship Augers
Anchors

Treenail Augers
Brass Bolts
Ship Clamps

Anchor & Sailing Lights
Ship Scrapers
Rowlocks

CLEATS Cast Iron, Galvanized, Brass

ROPE Wire, Manila, Tiller

THIMBLES Wire Rope, Sail, Brass

ANCHORS Loose Stock, Trawl, Folding

SHACKLES

BLOCKS Mall, Iron, Deck, Yacht

Mast Hoops
Boat Hooks
Life Preservers

Deck Plates
Rudders

Clinch Rings
Turnbuckles
Quadrants

HARTHAN PROPELLERS

Hawse Pipes
Fenders
Bilge Pumps

Chain Hooks
Eye Bolts
Snap Hooks

Bow Chocks
Stern Chocks
Boat Nails

SHIP CARPENTERS' TOOLS

TOPPING BROTHERS

ESTABLISHED 1885

122 CHAMBERS ST NEW YORK

JEFFERY'S
PATENT WATERPROOF
MARINE GLUE

Use as follows

For Deck and Hull Seams of Yachts and Motor Boats

USE—No. 1, Extra Quality

Black, white, yellow or mahogany color. Give black the preference; it is more elastic and satisfactory in every way.

Specified by all first-class designers, and used exclusively by all the prominent builders.

Use No. 7, Soft Quality Black, White or Yellow.

For waterproofing canvas for covering Decks, Tops of Cabins, Steel or Wood Boats, Canoes and Seaplanes. It not only waterproofs and preserves the canvas but attaches it to the wood and with a coat of paint once a year will last as long as the boat.

Waterproof Liquid Glue is used for the same purposes as No. 7, Soft Quality.

It is ready for use and requires no heating; simply open the can and paint it on, like ready-mixed paint.

This glue will also attach canvas, cork, felt, rubber, leather and linoleum to iron, steel or wood. All the prominent builders of seaplanes used this glue in combination with cotton cloth between the veneer in diagonal planking. It is also used for covering hulls with canvas.

Special Marine Canoe Glue. Best Filler for Canvas, Black, White and Yellow. Our 35c emergency cans made a big hit. Every canoeist should carry one; it is as valuable to him as a repair kit to a bicyclist or an automobilist.

Sent by mail on receipt of 40 cents in stamps. Canada 47c.

For Ships' Decks Use
No. 2, First Quality Ship Glue
No. 3, Special Navy Glue
All put up in 1, 2, 3 and 5-lb. cans; also 14, 28, 56, 112-lb. boxes, either tin or wood.

Every owner of a boat, whether motor, sail or row boat, either wood or steel, should send for our new booklets just out—*"Marine Glue, What to Use and How to Use It,"* and *"How to Make Your Boat Leakproof."* These booklets are up to date in every particular and answer practically all questions that may arise regarding the application of Marine Glue that thirty-five years' experience suggests. Write us today for them.

Put your problems up to us. We esteem it a privilege to have you do so. Our extensive experience is at your disposal.

L. W. FERDINAND & CO
152 Kneeland St Boston Mass

TOPPAN BOATS
POWER DORIES, GOV. MODEL LAUNCHES, ROWING AND SAILING DORIES AND SKIFFS.
Write for full information and prices.
TOPPAN BOAT MFG. CO. Medford, Mass., Dept. M.

Masters AUTOMOTIVE ACCESSORIES

Boatmeter
Oxifior
Tachometers
Gasoline Gage

MASTERS MANUFACTURING CO
7 WOOLSEY SQUARE, JAMAICA PLAIN, BOSTON, MASS.

Advertising Index will be found on page 156

Yard & Shop

(*Continued from page 76*)

The Sterling Line

The house organ of the Sterling Engine Co., of Buffalo, N. Y., which appears under the above heading every little while carries a message about their new Model G-R engine. The weight of the six-cylinder size is 1,953 pounds, which translates into 8.7 pounds per horsepower. This model taken together with the balance of Sterling products affords dealers a most complete range of high-grade motors.

Boyce Buys Erwin Patent

The Basic Erwin patent for years recognized as the fundamental principle of automatic fire extinguishing devices operating in enclosed spaces surrounding the gasoline engines, has recently been acquired by Harrison H. Boyce of the Moto Meter Co., Inc.

The Boyce Veeder Corporation has been formed for the purpose of further developing this invention, details of which will appear later. James A. Abeles has recently joined the Boyce Veeder organization and should prove a valuable aid to the corporation. It is said that this extinguisher will have many advantages over the accepted type and will sell at a price within reach of all.

New Electrical Installation Branch

In order that their ship's electrical installation and repair and mechanical communicating work may be more expeditiously handled in the Philadelphia district, Charles Cory & Son, Inc., main office and factory at 290 Hudson St., New York, N. Y., have announced the opening of new branches at 207 Market St., Philadelphia, Pa., and 83 Columbia St., Seattle, Wash.

The Cory company will carry in its branches a complete stock of marine electrical appliances and mechanical communication apparatus which will be available for immediate deliveries.

Aluminum Solder

An aluminum brazing solder which is guaranteed to be non-oxidizing is being introduced by the Aluminum Brazing Solder Co., of Philadelphia, Pa. It is put up in handy size containers and sold by the pound. It is said to make a repair which will be as permanent as a more expensive weld. For other metals such as iron, bronze, and brass castings a metallic filler is made which works at 300° F. and is capable of affecting permanent repairs without distortion.

Catalogs Wanted in China

The firm of M. W. Greig & Co., Foochow, China, write us that they have added motor boats, engines, and marine hardware to their business. They would like dealers in first class marine fittings and accessories to forward them their trade catalogs with prices and discounts. Any firm wishing to do business in China are advised to communicate with them.

(*Continued on page 80*)

Hickman Patents in all Countries

SEA SLED

Inverted V-bottom surface-propeller boats

Trade Mark Reg. U. S. Pat. Off.

Incomparably the finest sea boat in the world

A Successful Revolution In Motor Boat Design.

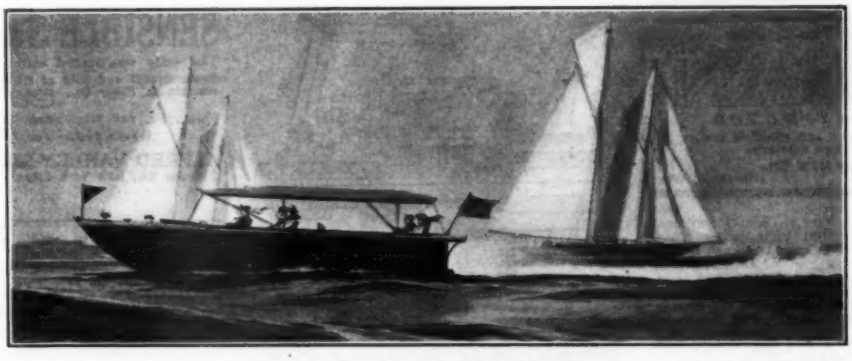
Much higher speed in rough water.

Greatly improved dryness and stability.

Absolute safety at all speeds.

The only boats capable of running at all speeds in shoal and weed-grown waters.

16-Foot Sea Sled



24-Foot Sea Sled at 36 Miles Per Hour

50-Foot Sea Sled at 50 Miles Per Hour

BOEING AIRPLANE CO.
Seattle, Wash.

THE SEA SLED COMPANY
BOSTON, MASS.

VIPER CO. LTD.
Pictou, Nova Scotia, Canada.

BILGE PUMPS

Copper or Galvanized Steel—2 to 4 inch diameter—any length. Also Sectional Pumps with removable valve.
Write for prices. Discounts to dealers.
BLUE & QUERIPEL CO., 2360 Third Ave., New York City

KA-URI
TRADE MARK
Waterproof Spar Varnish
For all OUTSIDE AND INSIDE work. Defies Salt Water. Guaranteed.
Brooklyn Varnish Mfg. Co. Brooklyn, N. Y.

Roebling Launch Steering Cable
Metallic Cord Center

Strong, Reliable, Durable
Send for Folder No. A-375
JOHN A. ROEBLING'S SONS CO., Trenton, N. J.

Paint DEVOE Paint
DEVOE & RAYNOLDS CO., INC.
NEW YORK CHICAGO

The Great Two-Cylinder
KOBAN
ROWBOAT MOTOR
The world's greatest and speediest motor
Write for new catalogue.
KOBAN MFG. CO.,
248 South Water St., Milwaukee, Wis.

FREE! Sonora Semi-Permanent Silvered Phonograph Needles replace steel needles, play 50 to 100 times, and are used on ALL MAKES of steel needle records. Economical, convenient, improve tone, and preserve records. 25c per card of 5, 40c in Canada. Write today for FREE sample.
Sonora Phonograph Sales Co., Inc.
George E. Brightson, President
279 B'way, Dept. 18, N. Y. Toronto, Ryrie Bldg.

TREGO
MARINE ENGINES
Two cylinders. Bore 5" Stroke 8"
12 H. P. at 400 R. P. M. 15 H. P. at 500 R. P. M
20 H. P. at 600 R. P. M. 25 H. P. at 800 R. P. M
Some excellent territory still open to reliable dealers
TREGO MOTORS CORPORATION
Builders of the U. S. Liberty Engines
New Haven Connecticut

RUNABOUTS
19, 22 and 25-Footers Standard Models
Complete with Power and Equipment or Hulls built to order complete at very reasonable prices. Dinks, Power Tenders and Bow Boats
BADGER MOTOR BOAT CO., Inc.
Address, Lake Ave., Cor. 4th St., Racine, Wis

BURGER BOATS
COMMERCIAL AND PLEASURE
If you plan to build a new boat this spring it will pay you to get our prices.
We are prepared to furnish any boat up to 200 feet for all purposes and we guarantee satisfaction.
Write for information
BURGER BOAT CO.
Manitowoc, Wisconsin

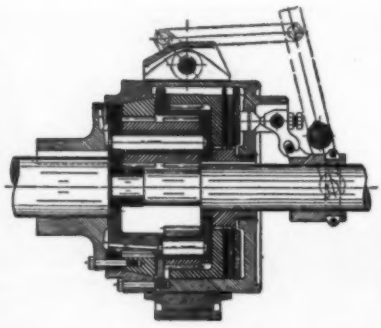
Yard and Shop

(*Continued from page 78*)

Husky Joe Reverse Gear

In presenting this up-to-date gear to the trade the Snow & Petrelli Mfg. Co., 156 Brewery St., New Haven, Conn., state that in constructing the Husky with a double internal gear drive for reverse motion they are utilizing the strongest and most durable type of transmission gearing known to the art, and lay special emphasis on its high ratio of reverse speed. The rapid development of heavy-duty oil burning motors for transportation and business purposes has emphasized the demand for a gear that will reverse at a rate of speed sufficient to make the boat respond quickly. The Husky Joes reverses at about 85 per cent. of the motor speed, which experience shows is the most satisfactory ratio.

Another very important feature of the Husky Joes is the suspended brake band, which is not only held off from the gear drum when running forward and neutral, but when locked for reverse it grips the drum through its entire circumference in a manner that prevents all side thrust on the gear.



In addition to the features already mentioned Husky Joes has lubricating reservoirs which receive and distribute the oil to all parts inside the drum, insuring perfect lubrication and long life to gears and bearings. Assured neutral position which is not adversely affected by centrifugal motion. Detachable engine flange which makes installation and removal from the boat quick and easy. Insertable propeller shaft which permits the use of any size, shape or length of stub back of the operating parts. A circular may be had for the asking, giving full description of this gear.

The company is prepared to furnish Husky Joes gear in various sizes up to about one ton weight and capable of transmitting above 50 h.p. per 100 r.p.m.

Wireless Equipment

We have received a very complete description book on wireless equipment as manufactured by the Wireless Specialty Apparatus Company, Boston, Mass. Any yacht owner contemplating an installation of this kind is urged to communicate with this company.

Advertising Index will be found on page 156

"WOLVERINE"
Heavy Duty Marine Engines.
Kerosene-Gasoline-Alcohol Suction Producer Gas.
WOLVERINE MOTOR WORKS
Bridgeport, Conn., U. S. A.

World Batteries Are Best
Plates won't buckle and are always damp. No wood, rubber or celluloid separators—won't splash—can't be over charged.
47% greater efficiency and 3 year guarantee.
Write for particulars
World Battery Company
1235-37 Wabash Ave. Chicago, Ill.

ATWATER KENT
AUTOMOTIVE EQUIPMENT
Atwater Kent Mfg. Company, Philadelphia

WICKER-KRAFT
YACHT FURNITURE
Used on the finest boats. Regularly supplied by highest grade boat builders Wicker-Kraft Chairs, fitted with life belts, are an original Wicker-Kraft idea.
Write for illustrated catalog.
WICKER-KRAFT CO., Newburgh, N. Y.

SENSIBLE Safety Suit
The only ventilated and sanitary safety suit.
Demonstrated and Sold at NEW YORK CITY by Abercrombie & Fitch Co., Brokaw Bros., Browning, King & Co.
Phila., Pa. and Washington, D. C., Jacob Reed's Sons
Write today for full details to
ALFRED VARLEY SIMS, Gen. Sales Agt.
2 Rector St., New York City Phone: Rector 7565

Have You Seen the New Bilge Pump for Motor Boats?
Greatest Thing Ever
Motion of the Boat Automatically Pumps the Water
Entirely Independent of Engine
Write for Descriptive Matter
ROCK-A-WAY PUMP CO.
63 Gorham Street West Somerville, Mass.

BOAT CEDAR
Just received a few carloads of choice Cedar. Can make immediate shipment. Good assortment of sizes. Also on hand: Oak, Mahogany and other woods for boat building.
WM. P. YOUNGS & BROS.,
35th Street and East River, New York City

February MoToR BoatinG
will be the Annual
New York Show Number
The New York Motor Boat Show Will be Held at Grand Central Palace, February 20th to 28th

AVOID disaster by using a DIRIGO compass on that boat. All materials first class. No rubber gaskets to rot. A very hard pivot and high-grade jewel. Navy degree circle on dial. Brass and mahogany binnacles. Also new course finder and bearings instrument. Send for descriptive catalog.
EUGENE M. SHERMAN
Box 3 Bellevue, Wash.

Yachting

America's Premier High Speed Engine

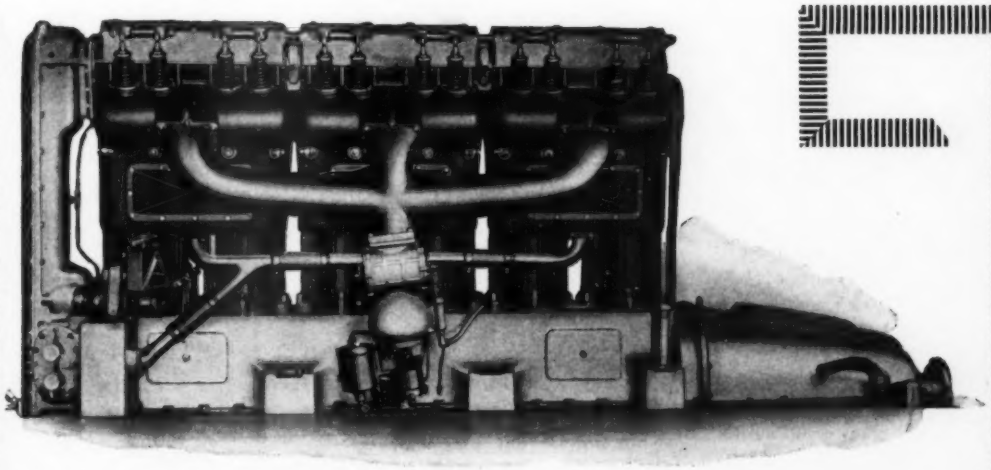
Murray & Tregurtha Model J-6, which develops 300-400 H. P. at 1000-1400 R. P. M. is the power plant being chosen by the elite of American yachtsmen for the finest and fastest express cruisers.

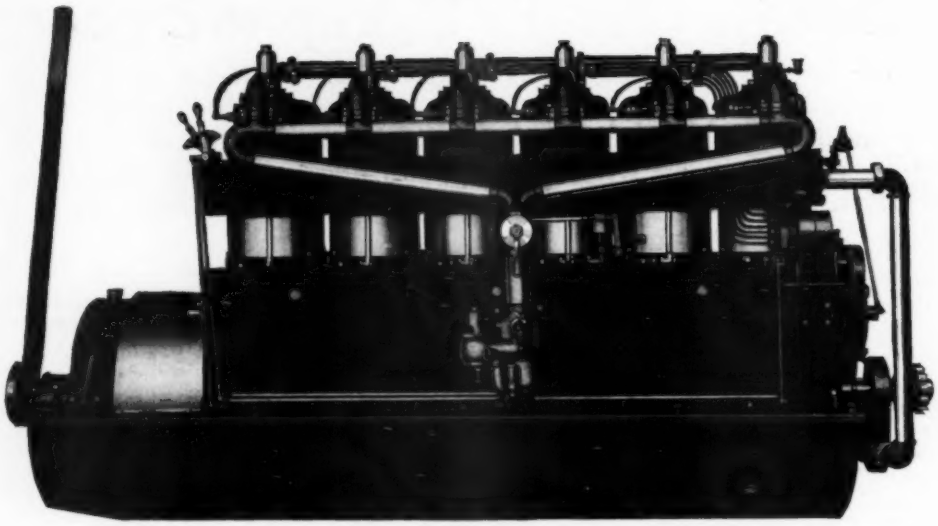
Despite its extreme power, the basic principles of marine engine construction have been adhered to, and the Model J-6 has remarkable stability and endurance.

We can give YOUR boat greater speed!

Murray & Tregurtha Corp.

Atlantic, Mass.





Less than 10 M. & T. Engines Out of Service Today

Murray & Tregurtha Engines have established a truly remarkable record for durability and serviceability.

They have now been on the market for nearly 28 years. In fact, the M. & T. was the third gasoline engine of any type to be manufactured in the United States. Hundreds of M. & T's have been built, yet in all that period less than 10 have been "retired from service" from any cause. All the rest are giving satisfactory service today. None has ever been lost in a wreck; but many a boat owes her safe return to the fact that her M. & T. kept ticking as steady as a clock, in the face of a terrific wind and sea.

We are proud of this record which, we believe, is the best proof we can offer that

"AN M. & T. WILL OUTLAST YOUR BOAT"

Murray & Tregurtha Corp.
Atlantic, Mass.

Advertising Index will be found on page 156

Ever Warm Safety Suit

PROTECTION

Absolute—complete for everyone on board in case of accident or storm. PROTECTION proven by severe test and accepted by the U. S. Navy Dept.

You cannot Drown—You cannot Chill

Steamship Companies Recommend Ever-Warm from actual knowledge of lives saved where death without an Ever-Warm was certain. Ever-Warm Suits are rented to ocean travelers.

On Yachts and Power Boats

on Sea and Lake by officer, crew and passengers Ever-Warm-Safety-Suits are being used because they are acknowledged the "only life saving device that has made good."

Ask for Pamphlet 23. It tells a story Every Boat Owner should read.

NATIONAL LIFE PRESERVER CO.
11 Broadway, New York 'Phone Bowling Green 5669
Territorial Agencies Granted.

"GOLDEN GLOW" SEARCHLIGHTS

"Golden Glow" Incandescent Searchlights are unequalled for safety and efficiency. They project powerful beams of golden-yellow light which penetrate fog and mist to a greater extent than any other known light.

"Golden Glow" Searchlights are wonderfully attractive. They are a prideful ornament to any craft—even in daytime.

Write for circular showing many other types.

ELECTRIC SERVICE SUPPLIES CO.
Manufacturer of Electrical Supplies
Searchlight Dept. Philadelphia 17th and Cambria Sts.

You drive the screw holes with a hammer in any material.

The screw holes are made for wood screws or machine screws to fit all sizes of screws. The head is removed and you leave a permanent screw hole.

The Stine Screw Holes Co.

Once a Screw Hole, Always a Screw Hole

Manufacturers
WATERBURY, CONN., U. S. A.
DEPARTMENT 21

The Biggest Little Thing in the World

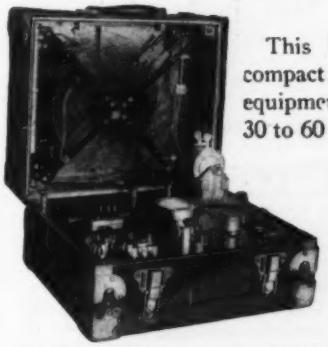
Some of the Reasons Why Screw Holes Will Be Bought and Used and Not Become Dead Stock for Anyone

1—They can be used without damage to receiving material.
2—They enable you to standardize to wood or machine screws in all material.
3—They are made of brass and will not rust under atmospheric or moisture conditions.
4—ECONOMY—They save more time value than the holes cost.
5—You get them for nothing and are paid for using them when you count time saved.
6—Screw holes have been needed ever since the first screw was used.
7—Special tools are NOT needed in using them in any material.
8—They can be used in any place a screw can be used.
9—By using screw holes, screws can be used in many places, and in many materials where it is impossible to use screws without them.
10—These are the only ready-made screw holes in the world.
11—No special screws are needed. These screw holes fit any wood screw or machine screw now in stock.
12—They make the neatest possible job in any material.
13—Every store where screws are sold must carry them in stock, because the line of screws is not complete without screw holes for them.
14—Every shop and factory where screws are used must also have these screw holes to fit the screws.
15—They are endorsed by all dealers in screws and by all users of screws.
15—Screw holes are entirely new and the world supply is yet to be furnished.
17—This is a progressive Old World of ours, and every active person in it must adopt all improved methods, and all new articles that will help him keep in the front line of progress.
18—Be among the first to stock up in screw holes if you are a dealer in screws.
19—Be among the first to install screw holes in your shop or factory, as you begin to save money soon as you use them.
20—In spite of the high cost of brass, screw holes are yet cheap.
21—We are letting the world know that screw holes can now be secured, by means of extensive advertising in all the principal Trade Journals that have the largest circulation among dealers in screws as well as users of screws.
22—Do not let your customer ask you for screw holes before you have them in stock. BE A LIVE WIRE.
23—They make everlasting holes in any material.
24—They mean "Ping-No-More" screw holes.
25—They are the result of Necessity being The Mother of Invention.
26—Anyone who can drive a nail can use screw holes.
27—Send for a sample and convince yourself.
28—Mechanics who see them say, "What do you think of that?"
29—In fact there are NO REASONS why screw holes should NOT be used.

Each of these reasons are enough to sell Screw Holes. There are many other reasons.

Write at once for our handsome **Color Card** showing screw holes in various materials which will be sent on request, together with samples and price list.

Radio Telegraph And Telephone Equipment



This is our complete, compact radio telegraph equipment designed for 30 to 60 foot cruisers.

The size of this unit is 18" x 15" x 10"

It weighs only 55 pounds.

It comprises both transmitting and receiving equipment. The transmitter may be driven from the cruiser's lighting system, directly from the main power plant, or by a small gasoline engine. The receiver requires no power whatsoever. The compactness, ruggedness and simplicity of this equipment renders it an attractive investment for yacht owners.

Other equipment for larger yachts for communicating over any distance.

Keep in touch with the world while cruising.

WIRELESS SPECIALTY APPARATUS CO.
Engineers, Designers, Manufacturers.
BOSTON, MASS., U. S. A.

PURDY BOAT COMPANY
Designers and Builders of
EXPRESS CRUISERS
TRENTON, MICHIGAN

INTEGRAL CAMSHAFTS
We make them for the leading builders of marine, airplane and automobile motors. We are Integral Camshaft Specialists, insuring the utmost in quality of workmanship and materials, accuracy and uniformity.
Let us quote on your designs.
MUSKEGON MOTOR SPECIALTIES CO.
Muskegon, Mich.

Nautical Instruments
Illustrated Compasses, Course Protractors, Bearing Finders. Every navigator should have them. Send for interesting catalogue. Address Box 45.
Marine Compass Company.
Bryantville, Mass.

40 H. P. VALVE IN HEAD

$1300
COMPLETE WITH ELECTRIC STARTER AND REVERSE GEAR
KNOX MOTORS ASSOCIATES, Springfield, Mass

Forgings and Castings
for marine work a specialty. Our experience in this particular field is at your disposal Get our estimates before specifying on aluminum, bronze and composition castings, also drop forgings of steel and brass
THE HARLEY COMPANY
1085 Page Blvd. Springfield, Mass.

OPLEX SIGNS
Are day signs as well as electric night signs. Full information on request.
THE FLEXLUME SIGN CO.
1441 Niagara St. Buffalo, N. Y.

Mullins Steel Boats Can't Sink
When you think of buying a boat, whether it be a 16-foot Runabout, a big 36-foot Auto Boat, or something in between—remember that Mullins Steel Boats are guaranteed for life. They cannot sink, leak, water-log, dry out or open at the seams—never require calking. Designed by America's foremost naval architects. More than 60,000 in use. Big catalog of steel or wooden motor boats, row-boats or canoes, on request.
The W. H. Mullins Co., 600 Franklin St., Salem, O.

WE CAN MAKE PROMPT DELIVERY OF NEARLY ALL SIZES OF THE FAMOUS
EMERSON 2 CYCLE 4 PORT
AT THE OLD PRICE
HERFURTH ENGINE & MACHINERY CO.
Alexandria, Va.

GIES REVERSE GEARS
RADIATE SATISFACTION
Five Models Write for Prices
GIES GEAR COMPANY
47 Fort Street East Detroit Michigan

Starting Correctly to Build

(*Continued from page 52*)

a "hole" for but one streak remains. This streak is called the shutter. Judge well as to the position of this on the turn of the bilge for the more nearly straight it is the more easily it will go into place. The shutter must fit tight; the tighter the better.

As both sides of the boat are theoretically similar, two streaks may be sawn to the same form, but do not think that these two opposite side streaks can be finished exactly alike. Discrepancies will creep in and because of this each plank will need to be fitted separately.

For the time being let's set aside the planing and finishing of the planking and turn to the making and fitting of the deck beams.

The beams which extend across the craft—the deck beams—are always cut to an arch, or better, to what boat builders call a crown. It is good practice to crown the deck beams which extend from sheer to sheer in the proportion of 2 inches to 4 feet. As a guide for laying these out I am including Fig. 54. The half circle in the center has a radius equal to the crown of the deck. Divide the length of the beam into eight equal parts, also the half circumference of the semi-circle and set off the lengths from the baseline to the intersections of the radii and the semi-circumference at the points designated 2, 3, 4, etc. This process does very well for beams of low crown. But it will not do at all for highly crowned frames. Such, for instance, as are employed in the decking of small raised-deck cruisers; or as are employed on the house tops of trunk cabins.

For this class of deck frame a simple apparatus like that shown in Fig. 55 will prove accurate in describing the correct crown of any deck beam. Only the measurements for the width and the length of each deck beam are required. The two legs, A and B, are then set up on the base C successively at the distances required for each frame and tack the ends secure. Then with a nail at D and E and a pencil at F an arc is described by swinging the wooden triangle to the right and to the left, being careful the while to keep both the legs A and B against their respective nails D and E.

Thus are the deck beams laid out—the depth of the beams are, of course, measured parallel to the top edges and with a regular carpenter's gauge.

Now, in order to securely fasten the deck beams to the rest of the frame they should be set and fastened alongside of a timber head and down upon the clamp as shown in Fig. 56. This, as is evident, will tie the two sides of the craft together and prevent all tendency of spreading. Although, and for the sake of economy, few of the present day boat builders secure hanging knees under the deck beams it is a sterling way to give strength to the entire structure and I should if I were building a small, or a large, boat of any description insist upon natural crooked knees being placed in at least three points under the deck and, of course, at both sides of the vessel.

Before I close this part of "Starting Correctly to Build" I wish to mention that steam-bent deck beams are not entirely satisfactory, nor are they at all easy of creating. If it is desired to eliminate cross grain I would suggest that the builder combine the cut and the bent beam as shown in Fig. 57. This is an easily accomplished thing to do and adds wonderfully to the strength of light deck beams.

Advertising Index will be found on page 156

Hunting Boats, Canoes, Rowboats, Fishboats and Motor Boats. Catalog Free. Save Money. Order by Mail. Please state what you are interested in.
THOMPSON BROS. BOAT MFG. CO.
1907 Ellis Avenue Peshtigo, Wis.

SIMPLEZY
Galvanized Iron Boat Pump
Best low priced pump made.
Write for price and description.
BURROUGHS TOOL CO.
87 Warren Street NEW YORK

Tillinghast Racing Green
"PROVED BY TEST"
"Always a clean racing bottom"
for either the yacht or commercial boat be it built of steel or wood.
TILLINGHAST PRODUCTS CORP.,
299 Broadway New York City

POLARINE
The Standard Oil For All Motors
Standard Oil Co. of New York

PALMER ENGINES
If the demands you make of a power plant are of more than usual severity it will pay you to investigate the qualities that prevail in the Palmer. Built for any duty under any conditions, the Palmer Engine powers many of America's best boats.
PALMER BROTHERS
Cos Cob Connecticut

"New Jersey" Marine Paints
Paint and varnish specialties of the highest quality for every marine purpose. Used by experienced boatmen the country over. Sold by dealers everywhere. Write for complete information.
NEW JERSEY PAINT WORKS,
Harry Louderbaugh, Inc.
Jersey City, New Jersey.

IMPROVED THERMEX SILENCER
Increases Revolutions, No Back Pressure!
Cannot clog, nor collect salt; water cannot flow back to cylinder. No heating, no odor. Used free or under water—adjustable discharge. Lightest, cheapest to install. Free booklet shows why. Send for it today.
CENTRAL MFG. CO.,
185 Liverpool St. East Boston, Mass.

PUMPS
Made by the
Lipman Mfg. Co.
for circulating purposes are the very best. Hundreds of Thousands in use. Send for Catalogue.
233 Pleasant St. Beloit, Wis.

Gear Pulling Made Easy

Says the Master Mechanic. The Greb Automatic Grip Puller is a One-Man Puller—Quick-acting, strong and simple in the extreme. May be locked in any desired position. A combination of two or three arms. Heavy Duty Size capacity 1" to 18"—Junior size capacity 1" to 7" Two sets of jaws furnished with each size.
Ten Days' Trial If your dealer or jobber does not have them we will send you one. Try it ten days. If not satisfactory, return to us and we will refund your money. We also make the Greb Rim Tool.
THE GREB CO., 225 State Street, BOSTON

MILLER

Marine Distillate Engines

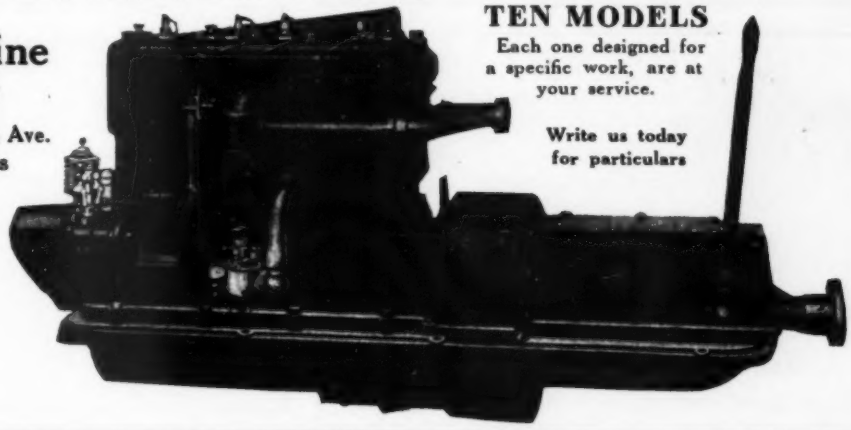
Use Gasoline, Kerosene with Equal Efficiency

Miller Marine Motors have been sold for nearly twenty years solely on the basis of reliability and efficiency. Year in and year out we have been striving to improve, where possible, our almost perfect motors. Today we offer to you a Miller motor to meet your requirements, be it for a small boat, a heavy sea-going cruiser or work boat.

Miller Engine Company

2329-2331 No. Tallman Ave.
Chicago, Illinois

San Francisco Agents:
Burton Machine Works, 2256 Greenwich St.
Agents for the North Pacific Coast:
Pacific Marine Engine Co., 78 Marion St., Seattle, Wash.
Agents for the South and Gulf Coast Points:
Menge Marine Hardware & Supply Co., New Orleans, La.



TEN MODELS

Each one designed for a specific work, are at your service.

Write us today for particulars

THE STANLEY ENGINE

Best in design, workmanship and price

These motors are of the 2 port 2 cycle type. One cylinder make and break up to 7½ H.P.—Two cylinder jump spark up to 14 H.P.

Stanley Engines are designed for both pleasure and working boats. The single cylinder engines are more especially of the heavy duty type.

For Sale—25 ft. Seabright Cabin Dory—12 H.P. Bridgeport Motor, Paragon Gear. $450.00

The following new engines for immediate delivery:

10 H.P. Make and Break Stanley....$ 250
14 H.P. Jump Spark Stanley..... 250
100 H.P. Fulton Anderson Bosch Magneto, no reverse gear..... 2500

The Stanley Engines are owned and manufactured by

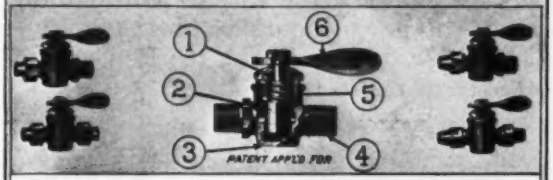
SUTTER BROTHERS

44 Third Avenue - New York City

Agents for Fay and Bowen, Clay heavy duty, Joes Reverse Gears, Wizard Magnetos, K-W Coils

Michigan Motor Fittings

"The Guaranteed Kind"



Kant-Leak Gasoline Cocks

are leak-proof

1. **The stem is packed** with an asbestos packing, which prevents any leaks at that point.
2. **The plug is ground** to a glasslike finish, which insures a perfect seat.
3. **The bottom is closed,** and so there can be no leak there.
4. **Standard connections furnished.** See our circular for various sizes and styles of connections.
5. **Stiff spring locks handle** against turning from vibration.
6. **Large, stamped brass handle** turns quite easily.

Write for Kant-Leak Circular

Michigan Lubricator Company
Detroit, Michigan

Sandusky Dinks & Pleasure Craft

KNOWN and accepted by the boating world as the ideal tender for the highest class yachts, "Sandusky Dinks" are regularly specified by discriminating boatmen.

Sandusky Dinks are only the well known Davis Dinks under a new name. Material and construction are the same unexcelled standard.

Row and Power Dinks always in stock in sizes from 8 to 16 feet. We also build pleasure boats to order in all sizes and types.

Send for your copy of our catalog today

SANDUSKY BOAT & CABINET WORKS, Sandusky, Ohio

STORM PROOF
Keystone COVERINGS

Cotton duck, all widths and weight Sail duck.
1000 waterproof tarpaulins for immediate shipment always on hand.
Tool kits for seven tools at 50 cents. Larger sizes to order.

KEYSTONE CANVAS GOODS & FLAG CO.
1012-14-16-18 Filbert St. Philadelphia, Pa.

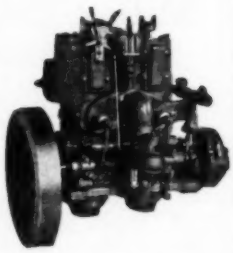
The way to get the best circulation on your automobile or boat is to use a Lobee Pump.

Most pumps are just pumps for which nothing can be said, but—owners of Lobee pumps can never say enough in their favor.

Get the Best there is.

LOBEE PUMP and MACHINERY COMPANY
57 Bridge Street Buffalo, N. Y.

The "SUPERIOR"



The motor of consistent, reliable, economical service for work and pleasure boats.

Mechanically operated intake valves.

Leak proof main bearings.

Built to last a life time and will do it.

We guarantee you satisfaction or your money back.

One cylinder, 6 H. P. complete equipment...$150.00
Two cylinder, 12 H. P. complete equipment... 225.00

Superior Motor Works, Jackson, Michigan

MOXLEY BOATS

Choose your new boat from one of our stock designs, or if you wish we will build to order, following your own ideas. Stock Launches—16 ft., 20 ft., 25 ft.; Rowboats —12 ft., 14 ft., 16 ft.

Prices on application

Cruisers—Write for prices and details.

W. J. MOXLEY & SON
Office & Factory - - Cos Cob, Conn.

STEARNS McKAY
MARBLEHEAD ANTI FOULING GREEN BOTTOM PAINT

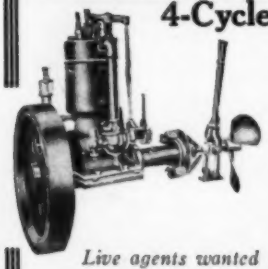
FOR STEEL OR WOOD STAYS CLEAN

Gives the greatest efficiency with the smallest fuel consumption.
Semi-enamel White for topsides.
Stearns-McKay Mfg. Co. Marblehead, Mass.

WHICH BOAT WASTES FUEL?

STANDARD KID

4-Cycle Engines of Quality



Made in six sizes — light, medium, and medium heavy duty. 3 h.p. to 20 h.p.—1 to 2 cylinders.

Uses either gasoline, distillate, or kerosene.

Suitable for workboats, fish skiffs, sampans, pleasure boats, etc.

Working parts on lightweight models, interchangeable with Ford engine parts.

Live agents wanted in all parts of the world.

SEATTLE-STANDARD ENGINE MFG. CO.
SEATTLE, U. S. A.

Just Suppose This Happened!

Your ignition failed suddenly—no lights, no spark—and you found yourself in a dangerous position. It couldn't happen if you had installed a

Weston
Model 301
AMMETER
On Your Bulkhead

It tells you exactly, and at all times, the rate of charge or discharge of your battery. You know before it is too late whether your battery is being maintained in the condition which will insure you perfect service. Write us—let us tell you about it.

Weston Electrical Instrument Co.
28 Weston Ave., Newark, N. J.
Branch Offices in the Larger Cities

Advertising Index will be found on page 156

CHAS. CORY & SON, INC.

ESTABLISHED 1845

New York—290 Hudson St.
Phila., Pa.—207 Market St.
San Francisco, Cal.—585 Mission St.
Seattle, Wash.—83 Columbia St.

Electrical and Mechanical Telegraphs.

Marine Electric Lighting Fixtures and Wiring Accessories.

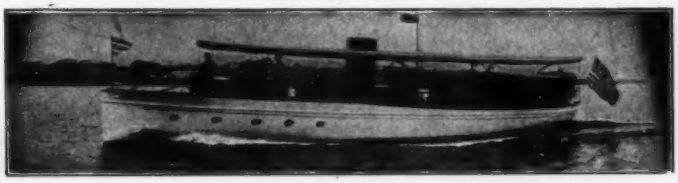
Special attention given to Yacht and Motorboat electrical equipments, including fixtures, wiring accessories, bells, annunciators, push buttons, etc.

Mechanical Communication Appliances, including engine telegraphs, gongs, gong pulls, sounders, voice tubes, fittings, etc.

Complete electrical and mechanical installations for all classes of vessels solicited.

20th CENTURY Gasoline Motors

2-Cylinder—6½" x 8½"—15-20 H.P.—400 R.P.M.
4-Cylinder—6½" x 8½"—40-50 H.P.—400 R.P.M.
6-Cylinder—6½" x 8½"—65-75 H.P.—400 R.P.M.
Strictly high grade four-cycle engines, built for heavy duty service.



65 ft. x 14 ft.—JINETTA—J. H. Becker

Most yachtsmen know of the satisfaction given by yachts designed, built and powered by us; our experience is at your command; plans on file of all size yachts.

Send Us Your Inquiries

NEW YORK YACHT, LAUNCH & ENGINE CO. :: **Morris Heights, New York City**

Improved Motor Boat Closet

Figure 1404

Dimensions: 18 x 18 x 11" high to top of bowl; 2½" cylinder. For above or below water line.

The best little closet on the market today, possessing many of the advantages of the large size toilet. All brass and porcelain. Oak seat and cover.

All prices subject to market advances, which are continually changing.

THE J. H. CURTISS CO.

The J. H. Curtiss Co.

Pioneer Specialists in Marine Sanitary Fixtures

Since our advertisement appeared in the first issue of MoToR BoatinG, December, 1907, hundreds of Curtiss fixtures have been installed in motor cruisers and yachts of all sizes, including some of the finest boats launched within this period.

The Curtiss line is exceptionally complete, varied in type, size and price to meet every possible requirement. Each model has been designed in accordance with our wide experience in boat work and can be depended upon in quality, service and durability no matter whether it is our highest or lowest priced model.

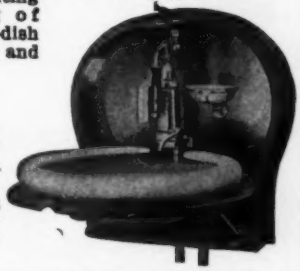
"PRICES ON APPLICATION"

With Pump

Cock on pump swings upward, thus preventing breaking of bowl. Soap-dish is porcelain and removable.

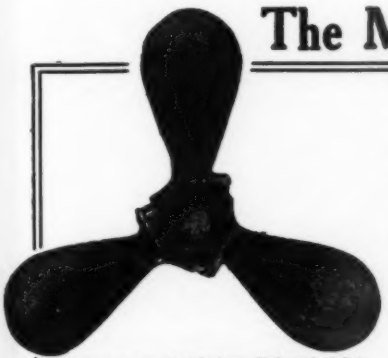
No. 5
Height, 19 in.
Width, 19 in.
Depth Closed, 6 inches.
Quartered Oak Case, or Mahogany Case.

Lining and Fixtures Nickel-plated. Porcelain Bowl. Mahogany or Quartered Oak Case.



2 South Street, New York

The Michigan Reversible Propeller Wheel



We also manufacture Universal Joints, Couplings, Stern and Thrust Bearings, Ball Races, Power Bilge Pumps.

Don't take up valuable room in your boat with a cumbersome and troublesome reverse gear.

With a Michigan Reversible Propeller on your boat you are free to navigate without danger of collisions and with the same safety as with a reverse gear costing many times more. Besides this you are saved the annoyance of repairs and break-downs so often occurring with a reverse gear.

Michigan Propeller Wheels are designed and constructed for service and results.

A propeller for your every need.

Write to-day for information.

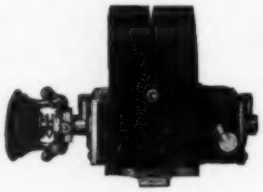
MICHIGAN WHEEL COMPANY

C. J. LITSCHER, Pres.

GRAND RAPIDS **1240 Monroe Ave.** **MICHIGAN**

Quality Goods

Lighting Outfits — Magnetos Generators



HENRICKS

Magneto & Electric Co.

1237 St. Paul Street, Indianapolis, Ind.

PERFORMANCE

is what you buy, when you buy the

C. A. J. 25 H. P. 4-Cylinder, 4-Cycle Overhead Valve Marine Motor for Runabouts, Small Cruisers and Workboats.

THE JACOBSON ENGINEERING COMPANY, INC.
30 Church Street NEW YORK
Marine engines, gasoline, oil, producer gas.
All sizes to 8000 H. P.

Perfect Control is Essential to Safety
Specify a "Reliance" Steering and Engine Control
30 Styles
Write for Literature
W. S. HALL CO.
Rochester, N. Y.

ONE WAY ONLY—THE BEST WAY—BUY!

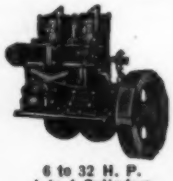
We Sell Our Sets

Wireless for Ship *and* **Land Stations**

CUTTING & WASHINGTON RADIO CORPORATION
GENERAL OFFICES
6 and 8 West 48th Street, New York, N. Y.

REX MARINE ENGINES

TWO CYCLE TYPE



6 to 32 H. P.
1 to 4 Cylinders

Features

Two port or combination two and three port. For gasoline or kerosene fuel. Jump spark ignition. Water circulation through cored passages, thus eliminating many and troublesome pipe joints. Removable head. Large hand holes. Bearings for crank pin and main bearings of genuine babbitt bushings, easily replaced. Bronze connecting rod. Heavy crankshaft, 1⅛" in diameter.

By combining simplicity of design and quality in material, we aim to produce an engine to meet strict specifications and to give reliable service.

Export Shipments Heavily Boxed and Strapped

Neponset Engine & Machine Co.
Neponset Sta.
Boston, Mass., U. S. A.

"I mix my colors with brains," said Titian when pressed for his secret in obtaining a rare blue marine.

We'll pick up your goods—anywhere, we'll deliver them—anywhere; be it forwarding or clearing or a puzzle in trucking or a snag in insurance—pass it up to us, for we, too, mix service with brains.

A. M. LESLIE COMPANY

Foreign Forwarders and Freight Contractors
CUSTOM HOUSE BROKERS
Sole U. S. Agents "Messageries Internationales"
109-111 BROAD STREET, NEW YORK CITY
Tel. Broad 5425
Warehouses 91-93 Thompson St.

America's Finest Motor Boats

Whatever you want—Runabout, Speed Boat, Cruiser, Rowboat or Canoe.

There's a **Racine Wis** Made for you

—or we will design and build one to meet your needs.
Tell us the type of boat in which you are interested and we will mail you our special catalog immediately.
RACINE BOAT COMPANY, 1812 Clark St., Racine, Wisconsin

LOOK

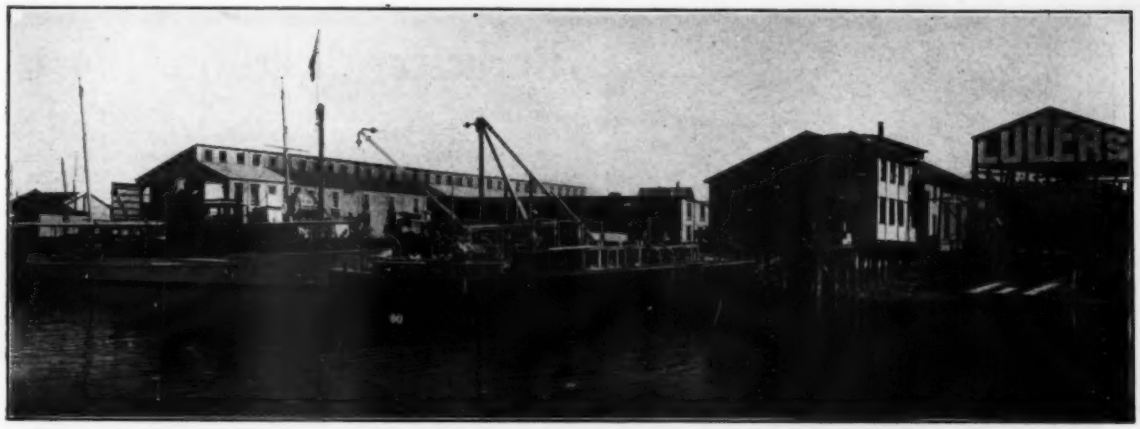
Can you equal these prices? Class I outfit, consisting of Bow Combination Light, Stern Light, Life Preserver Pillow, Fire Extinguisher and two tone Horn complete. Guaranteed to pass Government inspection, $4.50.

Pol. Brass Bilge Pump	$2.10
12" Steering Wheel	1.40
Brass Fog Bells	1.20
Two tone pol. brass Horn	.90

Class II Equipment, $10.00.
Complete Catalogue on Request

UNIVERSAL MOTOR BOAT SUPPLY CO.
Atlantic Highlands, N. J.

Advertising Index will be found on page 156



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LUDERS

THE LAST WORD IN YACHT DESIGNING AND BUILDING

LUDERS MARINE CONSTRUCTION CO.
STAMFORD, CONN.

NO MYSTERY!

THERE IS NO MYSTERY SURROUNDING THE

Much-Talked-of Performances

OF THE

TALBOT

STEAM UNIT

It is EFFICIENT because it is a single, self-contained unit within which both high temperatures and high pressures are produced and safely maintained. Engineers are agreed such an apparatus assures maximum efficiency.

It is the most COMPACT steam plant on the market in proportion to horse-power produced. Occupies about the same amount of space as a gasolene engine.

For ECONOMY in operation a Talbot steam plant is without an equal. A Talbot plant burning crude oil will, in the course of 300 working days, practically pay for itself in the saving of fuel alone.

A Talbot steam plant is SAFE because it has no water level; no steam dome; no mud drum nor any other large pressure container. It cannot explode in a manner to endanger lives or property.

Standard Sizes, 25 to 1,000 H. P.

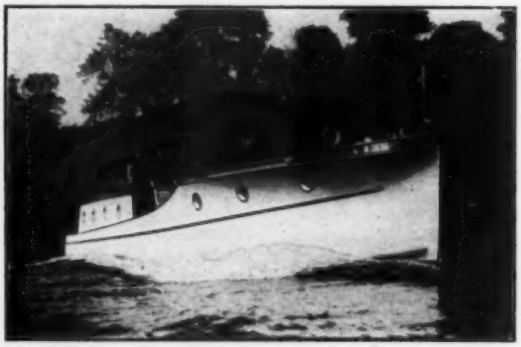
Write at once for our Bulletin "B" and give such particulars as will assist our Engineering Department.

Dealers—we have some desirable territory open for representation. Write us for our agency proposition. "SUPER-HEATED STEAM THE ULTIMATE POWER."

TALBOT ENGINEERING CORPORATION

Factories—PLATTSBURGH, N. Y.
MONTREAL, CANADA

66 BROADWAY, NEW YORK CITY



Rochester "Bilt-Rite" Boats

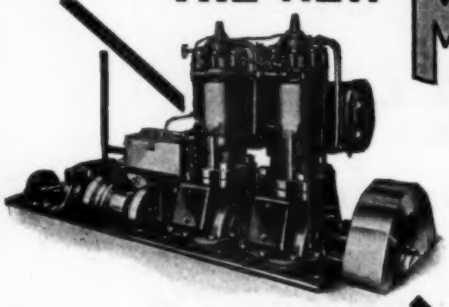
are produced by men of experience. The result of years of close association with matters pertaining to pleasure afloat are given expression in our designs. They are replete in the comforts and conveniences that make a cruise really pleasurable.

The forty footer illustrated is a home afloat for a party of six. We have them from twenty-six to fifty-five feet. One of them will fit your requirements. Let us send you full information.

It takes months to build a high class cruiser, therefore, you should contract now for your 1920 boat.

Rochester Boat Works, Inc.
Charlotte Station **Rochester, N. Y.**

THE NEW MIANUS MARINE MOTORS OIL ENGINE



An Engine Combining the Diesel Principles of High-Compression Ignition with the Simplicity and Greater Advantages of a Swedish System of Fuel Injection.

HIGHEST EFFICIENCY AND ECONOMY—perfect combustion with no carbon, soot, smoke or odor. Guaranteed fuel consumption 6/10 pint per H. P. hour or better.

No electrical devices—no hot plates, tubes or torches. Easy, positive starting, quiet, vibrationless operation.

SOLID FUEL INJECTION—Avoids use of compressors and high pressure valves necessary in other types.

RUNS PERFECTLY at low speeds, load or no load, with perfect ignition and combustion.

LARGE AND SMALL SIZES—The only engine of the compression-ignition type made in the smaller sizes.

Ask for Bulletin "O"

THE MIANUS MOTOR WORKS : : : Stamford, Conn., U. S. A.

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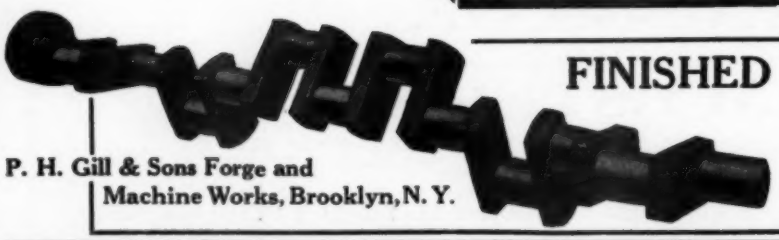


FINISHED CRANK SHAFTS

We are furnishing them to some of the leading marine engine builders. Carbon and Alloy Steel, Heat Treated to your own specifications. We grind all Pins and Bearings. Forged, machined, and finished complete in our own plant. Let us quote you.

P. H. Gill & Sons Forge and Machine Works, Brooklyn, N. Y.

If You Want

to know anything about boats or boating, about the marine market or the marine industry, write the Editor of MoToR BoatinG for information.

MoToR BoatinG is the leading magazine of the marine field—leading in circulation and advertising value as well as in authority and interest. It exists for the service it can render to boat owners and to members of this industry. Let it be of service to you.

MoToR BoatinG : 119 West 40th Street, New York

R. W. ZUNDEL CO. Inc.

ZUNDEL

HERE'S A WINNER

Zundel Loud Sounding Electric Horn, the only genuine marine type electric vibrator horn. Waterproof. Sound carries further than any auto horn. Polished brass bell, black enamelled base. Operated by dry cells or storage battery.

Retail price $8. Discount on quantities.

We carry the most complete assortment of motor boat supplies in New York.

Special attention given to commercial, export and mail orders. **Write for catalog to-day—it's free.**

R. W. ZUNDEL CO., Inc.
47 Whitehall St., New York City
Phone: Bowling Green 9157

BOAT SUPPLIES

TO FLAG USERS

Our customers tell us we make the best flag on the market.

They report at least 50% more service from "Raven Brand" flags.

50% more service would mean a considerable saving to you in one year.

Why not make a little experiment and get your own facts?

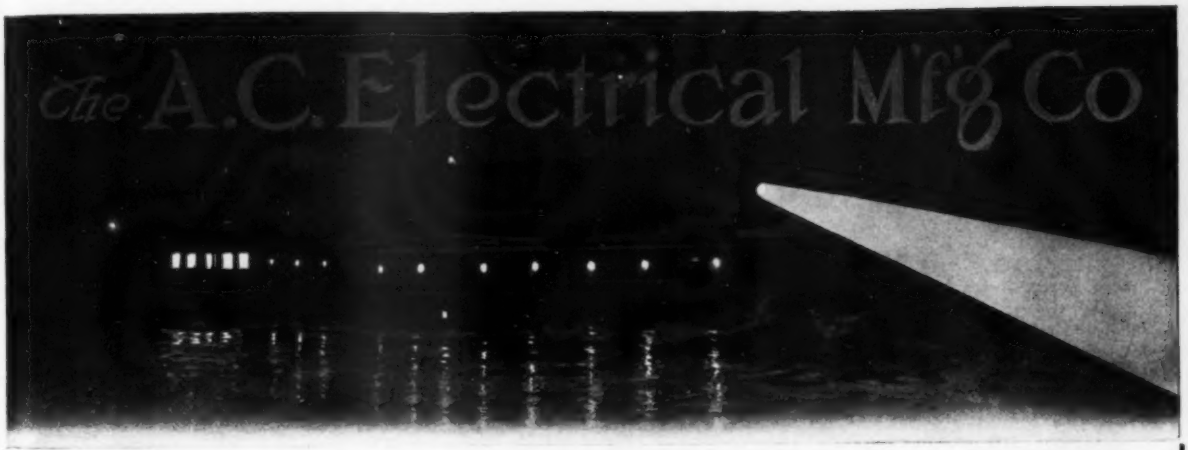
Get two flags of the same size, one made by us and the other the best flag you have ever used heretofore. If possible fly them on twin poles simultaneously, but if this is not practical, use them in alternate daily shifts.

We make flags for outdoor service and we are willing to have our flags judged by the amount of outdoor service they will give.

Practically every first class ship chandler on the Atlantic Coast handles "Raven Brand" flags. If your dealer does not handle them, let us know and we will send you the name of a dealer in your city who does.

BETSY ROSS FLAG CO., Inc.
Day Line Dock **Newburgh, N. Y.**

Advertising Index will be found on page 156



Exclusive Manufacturers of

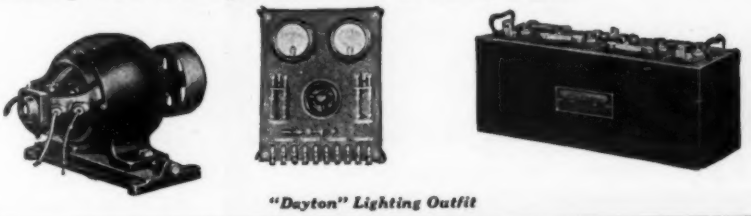
"DAYTON"

Motor Boat Lighting and Ignition Systems

Six—Twelve—Thirty Two Volt Systems. Four to Thirty Lights

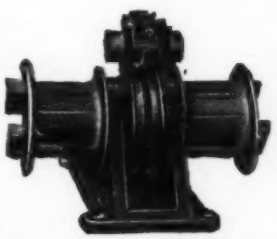
The "Dayton" Lighting Systems have been the Standard with the Motor Boat Trade for over Twenty Years. Thousands of them are in daily use, giving excellent satisfaction.

Write for Bulletin No. 65—Now



"Dayton" Lighting Outfit

THREE OF DURKEE'S MARINE SPECIALTIES



THE ANDRADE WINDLASS

CABINET HARDWARE
PORTLIGHTS
FOG HORNS
EELLS' & CRESCENT
ANCHORS

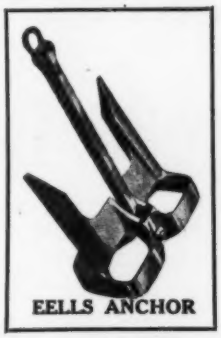
Send for Circulars

Send for Circulars

DURKEE LINE THROWING GUN

WE CARRY IN STOCK
EVERY PRACTICAL
ACCESSORY
IN THE ENTIRE LINE OF
MARINE HARDWARE

Send 25 Cents to Cover Cost of Delivery of Our New 1920 Catalogue, 1060 Pages, Just Off Press



EELLS ANCHOR

COMPASSES
LOGS
LANTERNS
TREENAILS
FLAGS, MOPS

D TRADE MARK

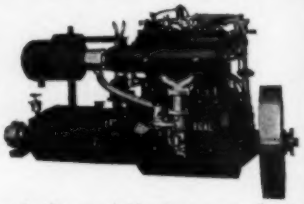
CHAS. D. DURKEE & CO. INC.

MANUFACTURERS OF MARINE HARDWARE

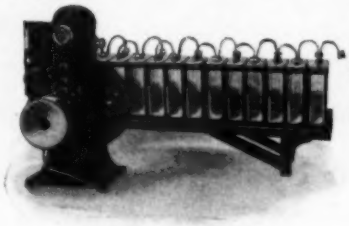
2 and 3 South Street, New York City, U. S. A. **Factory, Grasmere, Staten Island, N. Y. City**

18 Years of Real Service

REGAL Four Cycle Marine Engine



We have a motor built specially for your boat, whether for commercial or pleasure use. They are built right to run right on gasoline, distillate or kerosene. 2 H.P. to 50 H.P., one to four cylinders—125 lbs. to 6,000 lbs.



REGALITE

The Last Word in Electric Lighting Plants

For Yachts, Mills, Stores or Homes.

A directed connected plant, ¾ K. W. Generator. 2 H.P. air cooled motor. Capacity 45—20-watt lamps.

Regal Gasoline Engine Company

Coldwater, Michigan, U. S. A.

EQUIPPED FOR ECONOMY AND EFFICIENCY

95%

of engine trouble in motor boat operation is due to faulty revolutions.

JONES TACHOMETER

enables you to regulate engine revolutions to the point where maximum speed and minimum cost are absolutely assured.

Motor boat owners who have installed the *Jones Tachometer* are its most ardent supporters, while engine experts declare it is the—

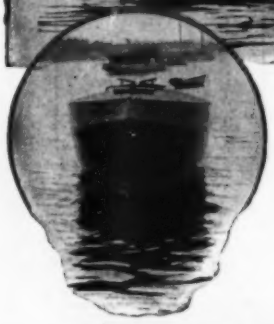
"BEST BY TEST."

Write for our New Booklet.

JONES-MOTROLA, Inc.

29-33 West 35th St., New York.

27 Foot Cabin Cruiser



We build all sizes and types, but have made a specialty of this design.

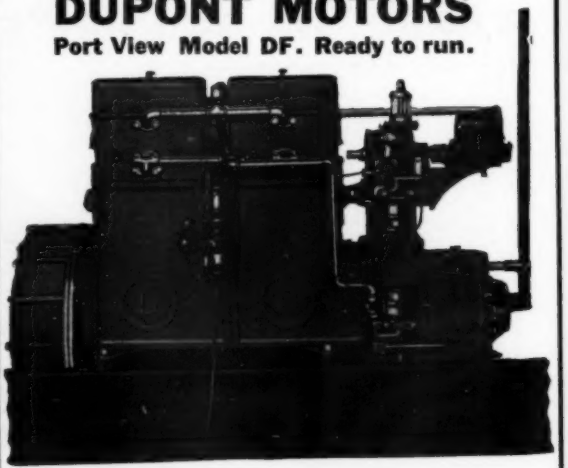
CONSTRUCTION and workmanship is the best—equal in every respect to the high class of yacht work on which our reputation has been based for over 20 years. The lines are very fast, the launch is safe and able in severe conditions of wind and sea, and it has a large cockpit and very comfortable accommodations below decks. It is equally adapted to day service or cruising.

STEARNS & McKAY CO.

MARBLEHEAD, MASS., U. S. A.

DUPONT MOTORS

Port View Model DF. Ready to run.



Completely Equipped—Equipment Built In. Entirely Enclosed and Self-lubricating.

Clean—Quiet—Accessible

Equipment includes Clutch and Reverse Gear; Electric Starter and Lighting System; Hand Starter; High Tension Magneto with Impulse Starter; Oil Pump; Circulating Water Pump; Bilge Pump; Air Pump.

We Guarantee Satisfaction

Delaware Marine Motor Company

2 Commerce St., Wilmington, Delaware, U. S. A.

Advertising Index will be found on page 156

RICHARDSON BOATS

Powered with a Sterling 4-cylinder Motor, Model F.S., 90-100 H.P., this 25'x5' 4" hand-designed V bottom runabout, built by us for W. B. Harbeson, developed a speed of 31 miles per hour.

Knockdown frames or complete outfit of the highest type if you wish.

Winton Engines powered these tugs built for the U. S. War Department.

No matter what type boat you require, we'll build it for you at the lowest possible cost and in the best possible manner.

We are always glad to submit designs in accordance with your particular needs, or, if you prefer, will build from drawings furnished by you.

All Richardson boats are built of the choicest materials available by master boat-builders.

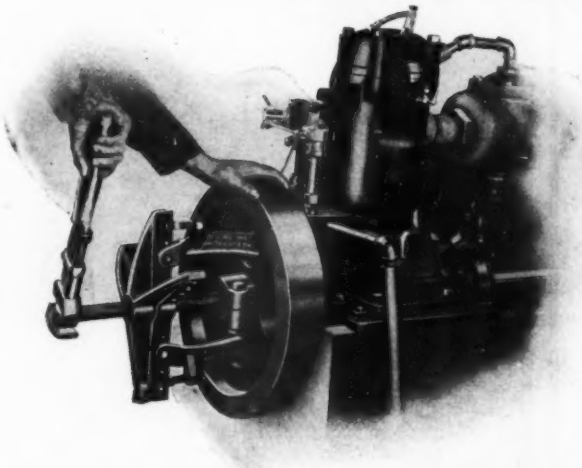
Runabouts, Cruisers, Tugs or Workboats are nothing but successful in every sense of the word if built by Richardson.

Any information will be gladly sent you

Richardson Boat Company
370 Sweeney Street
North Tonawanda New York

CRANE PULLER

LATEST "CROWFOOT" MODEL



Cut shows Tool removing engine flywheel, using only 2 Arms.

Equally adaptable for 3 blade propellers by using 3 Arms.

A 'ONE-MAN' TOOL
ELIMINATES BREAKAGE
Saves Time and Money

This Tool will save its cost on the first job.

Guaranteed for LIFE

Write for Latest Catalog. Order from your Dealer.

CRANE PULLER COMPANY
54 Lake Street **Arlington, Mass., U. S. A.**

YALE

The Costly Way The Yale Way

The Yale Way is the One-Man Way

MANY delays in Shipping and Receiving Departments can be overcome with the installation of a Yale Chain Block and Trolley System.

One man with the Yale Chain Block and Trolley accomplishes the handling of loads quicker and safer than a gang of men.

'From Hook-to-Hook-a-Line-of-Steel'

The new Yale 19D catalog shows you many ways to save money and increase production in your plant by using Yale Chain Blocks and Electric Hoists.

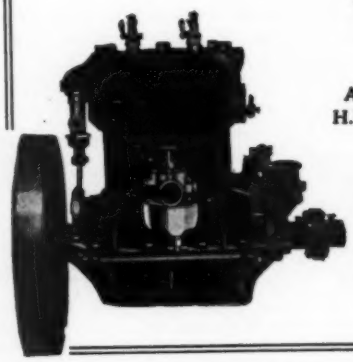
Let us send you your copy.

For a factory locking equipment use a Yale Master-Key System.

THE YALE & TOWNE MFG. CO.
Makers of the Yale Locks
9 East 40th Street New York City

Roberts Motors

Every Roberts Motor is run 6 to 8 hours turning its regular propeller in a tank of water with load conditions far greater than in actual service.



4-Cycle, 8 H.P.
Price $130.00

Also 4, 8 and 16 H.P. 2-Cycle Motors

ROBERTS MOTORS
Sandusky, Ohio

"JASCO" TANK

Safety with a Saving!

A leaky tank wastes fuel and makes the best built boat a "fire-trap."

The "Jasco" Tank cannot leak no matter how rough the service—it makes every drop of gasoline do its duty, and safeguards life and property.

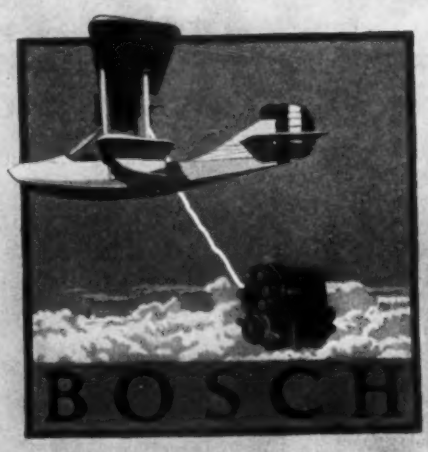
"Jasco" Tanks are made of the finest quality drawn steel—seamless, leakless, tinned and tested.

Equip your boat with a "Jasco" Tank—prevent fires and explosions.

Send for interesting literature.

JANNEY, STEINMETZ & COMPANY

MAIN OFFICE: PHILADELPHIA, PA.
New York Office: Hudson Terminal Building



The Supreme Ignition Test

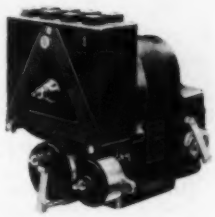
The life or death necessity for a continuous power stream is the reason for the popularity of Bosch Magneto Ignition among airmen. The same surety of ignition service which Bosch—America's Supreme Ignition System—has given thousands of aviation motors is assured in any Bosch Equipt Product.

AMERICAN BOSCH MAGNETO CORPORATION
Main Office and Works . . . . . Springfield, Mass.
Branches: New York Chicago Detroit San Francisco
More Than 200 Service Stations in Over 200 Cities

Advertising Index will be found on page 156

Berling Magneto is standard equipment for Sterling, Buffalo and Van Blerck

HIGHEST-CLASS motors rely on the Berling Magneto. It is standard equipment on Sterling, Van Blerck, Buffalo and other marine leaders. The Berling assisted in every big marine motor victory of the year, and in the air, sparked Roland Rohlfs' Curtiss Wasp to the world's altitude record. Where quality and faithful service are deciding factors, the Berling Magneto becomes standard equipment.



ERICSSON MFG. CO., BUFFALO, N. Y.

Berling Magneto

WORTH MORE DOES MORE

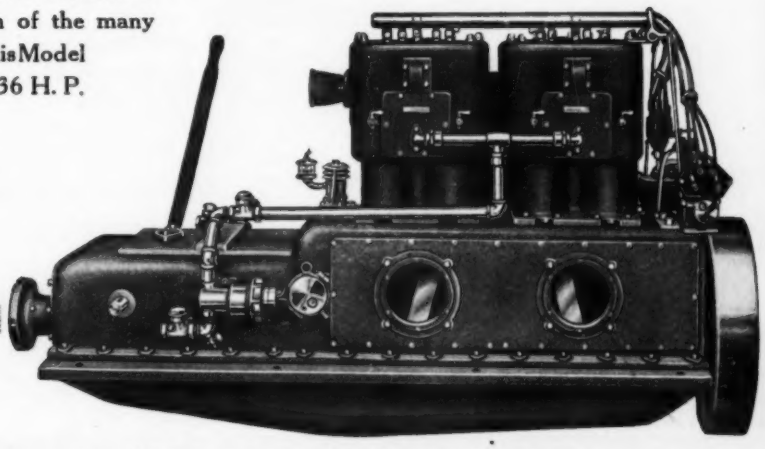
GRAY-PRIOR

FOUR CYCLE
MARINE MOTORS
Built up to a Standard-not down to a price

THIS GRAY-PRIOR MODEL D-4 embodies all that is best in modern marine engine construction. If you contemplate powering a cruiser or commercial boat don't buy your engine until you have sent for detailed description which will enable you to form a very clear conception of the many desirable and distinctive features of this Model D-4. Built in one size only, rated at 36 H. P.

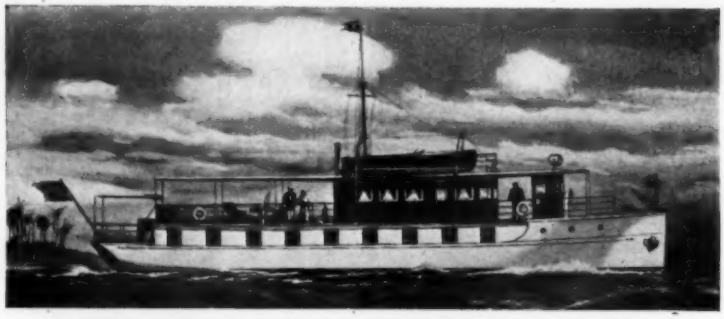
Experience Built It

Experience Chooses It



THE GRAY & PRIOR MACHINE COMPANY
56 Suffield Street
HARTFORD, CONN.

MATHIS BUILT HOUSEBOATS



NEW TYPE 80-FT. MATHIS HOUSEBOAT

Similar to the following two boats just completed by us this winter—Nadesah for J. H. & D. H. Carstairs, Philadelphia, and Osana, for Clayton G. Dixon, Philadelphia.

Combines every feature found in previous boats up to 106-ft. Gives maximum living capacity, permits navigation of tortuous Southern streams. Ideal for the Florida season.

Decided on Florida?

If you have made a last-minute decision to have a 52 to 80-ft. houseboat for this Florida season, communicate with us immediately and we may be able to make provision for you.

Mathis Yacht Building Co.

Specialists on Houseboats and Cruisers from 40 to 120-ft.

COOPER'S POINT, CAMDEN, N. J.

Bargains Bargains Bargains

We have for sale the following rebuilt Marine Engines which are guaranteed to be in good condition. These engines are a bargain at the prices listed below and they warrant investigation.

	Model	Type	Price
1	EM 6 cyl R. H. 5¾x6	Van Blerck	$1500
1	J 8 cyl R. H. 6 x6	Van Blerck	$2000
1	E 6 cyl R. H. 5½x6	Van Blerck	$ 750
1	C 6 cyl R. H. 5½x6	Van Blerck	$1000
2	B 4 cyl R. H. 5¾x7	Van Blerck new	$1500 each
1	M 6 cyl R. H. 5¾x6	Van Blerck	$2500
1	6 cyl R. H. 6¾x7¾	Dusenberg	$ 800

VAN BLERCK MOTOR COMPANY

MONROE, MICHIGAN

Advertising Index will be found on page 156

Mathis-Built Houseboats

Foremost in Florida Since 1909

RATHER than mere claims of leadership, we offer the evidence of satisfied owners. Nothing short of real reasons, would lead to the selection of Mathis-built Houseboats by men "who know", with the means to buy the best, like

A. P. Ordway
W. J. Matheson
H. N. Baruch
Murray Guggenheim
Ex. Com. Arthur Curtis James
George W. Perkins of New York
L. H. and A. W. Armour and Jas. Deering of Chicago

The large dining room on the Leonie.

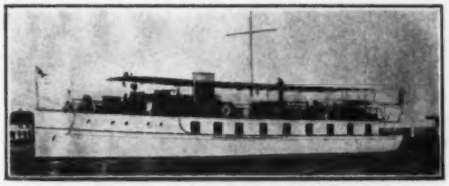
106-ft. Houseboat-Cruiser designed and built by us for Mr. Murray Guggenheim, New York.

INCREASED touring radius, sea-worthiness and economy of operation appeal to the best judgment of keen business minds; while the exceptional comfort and workmanship of Mathis-built houseboats lead to an increase in value after years of service.

Mathis Yacht Building Company

Specialists in Houseboats and Cruisers from 40 to 120 feet.

Cooper's Point, Camden, N. J.

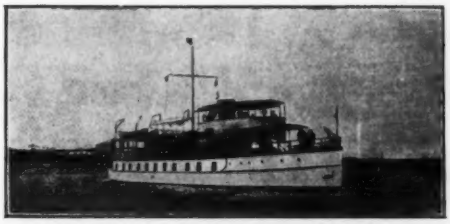


90-Ft. Houseboat-Cruiser "Bolo"

Owned by Mr. Felix Dupont. Built by us in 1912, it originated the new Houseboat-Cruiser Type.

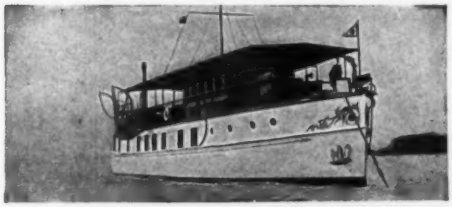
70-Ft. Houseboat-Cruiser "Calabash"

Built by us in 1912 for Mr. W. J. Matheson, New York.



106-Ft. Houseboat-Cruiser "Chieftain"

Built by us for Messrs. L. H. and A. W. Armour, Chicago, and **106 ft. Leonie**, built by us for Mr. Murray Guggenheim, New York.

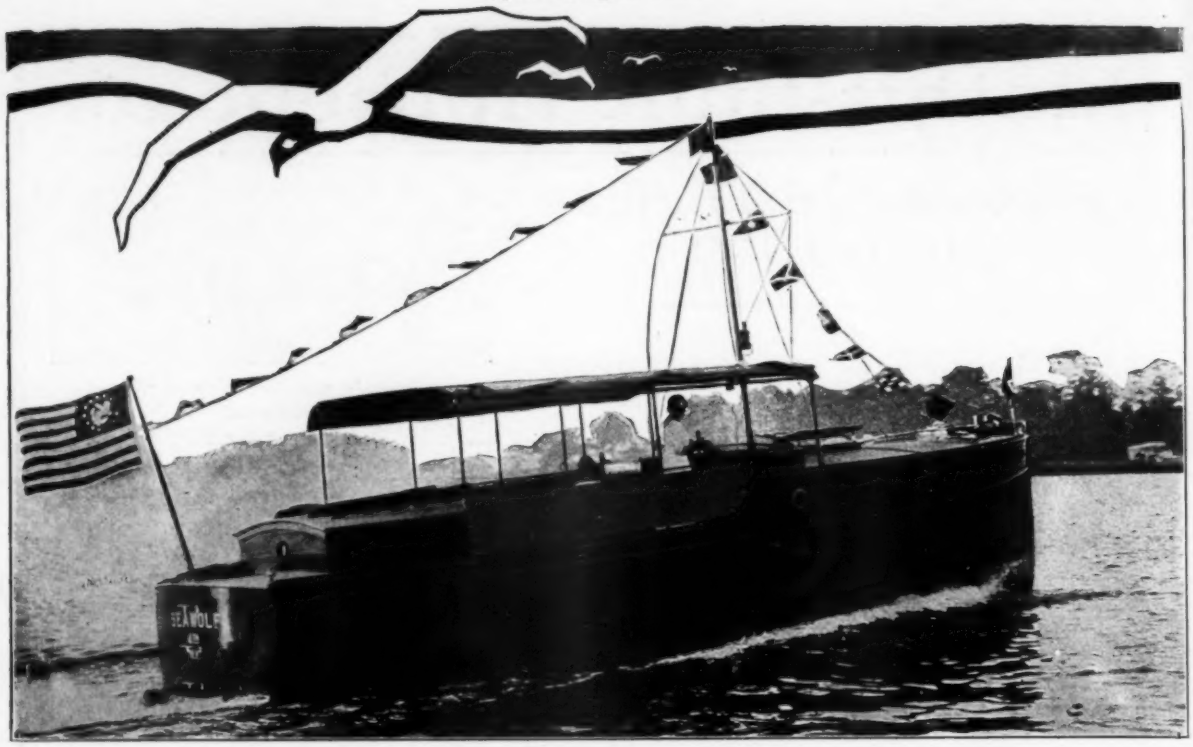


75-Ft. Houseboat-Cruiser "Alela"

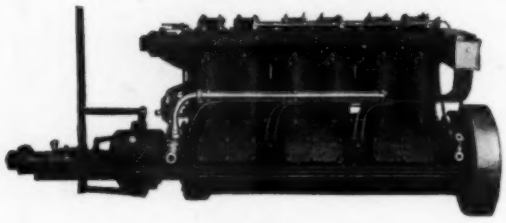
Built by us in 1914 for Mr. Albert Disston for whose father, Mr. William Disston, we created the new type house-boat, the Cocopomelo, in 1909.

95-Ft. Houseboat-Cruiser "Kismet"

Built by us for Mr. H. N. Baruch, New York.



Towed Disabled Thirty-Five Foot Cruiser for Three Hours in Bad Blow.



Frisbie
VALVE-IN-HEAD
MOTOR

5 to 75 H. P.—1 to 6 Cylinders

1-cyl.	5 and 7 H. P.
2-cyl.	10 and 16 H. P.
3-cyl.	18 and 25 H. P.
4-cyl.	30 and 40 H. P.
6-cyl.	50 and 75 H. P.

All Four-cycle

Frisbie Motor Co.,
Middletown, Conn.

September 17th, 1919.

Gentlemen:-

Thinking that you would be interested in the performance of one of your seventy-five horsepower motors, which I had installed in my new 40 foot cruiser, Sea Wolf 4th, I take pleasure in writing you the following:-

The service of this motor was at all times absolutely reliable and on two occasions under most trying conditions, once in a bad storm off Block Island which due to the big seas it was almost entirely up to the motor, the other occasion was off Orient Point in a bad blow the Frisbie towed a disabled 35 foot cruiser for three hours.

The economy was exceptionally low in both gas and oil, this is undoubtedly due to the overhead valves. I have owned several motors, but none had as low consumption as the Frisbie.

I am delighted with the motor, its service, and the abundance of power it has.

This note is unsolicited and you are at liberty to use it in any way you like.

Yours sincerely,

LeRoy Moody

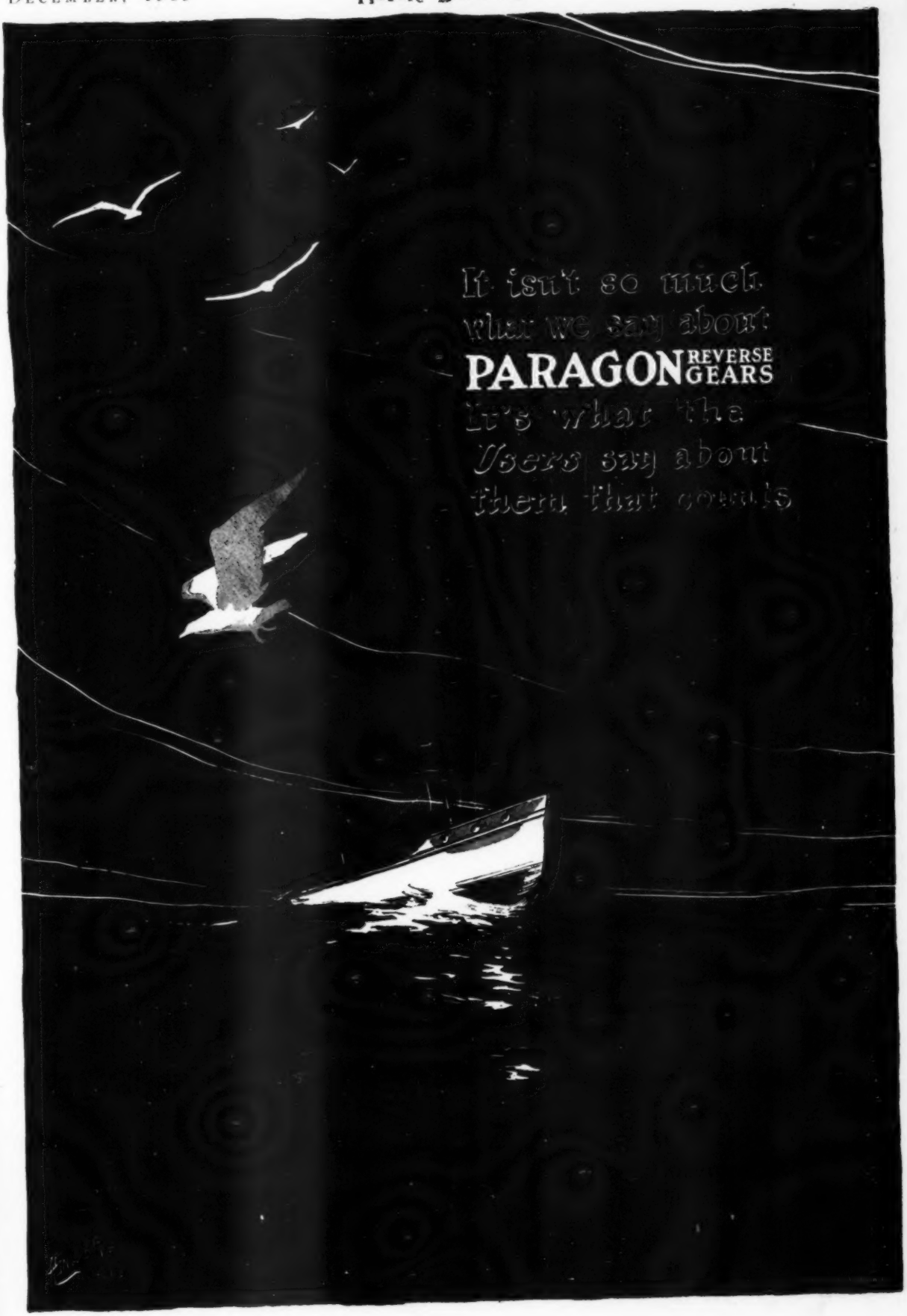
Treasurer for Thomas E. Adams
25 West 57th Street,
New York City.

Frisbie an' I

Frisbie Motor Co., 7 College St., Middletown, Conn.

Send for Free Literature

Advertising Index will be found on page 156


It isn't so much
what we say about
PARAGON REVERSE GEARS
It's what the
Users say about
them that counts

PARAGON

BROWN & HOWE
WOOL
213 SUMMER STREET
BOSTON, MASS. October 28, 1919

JACOB F. BROWN
ALBERT S. HOWE

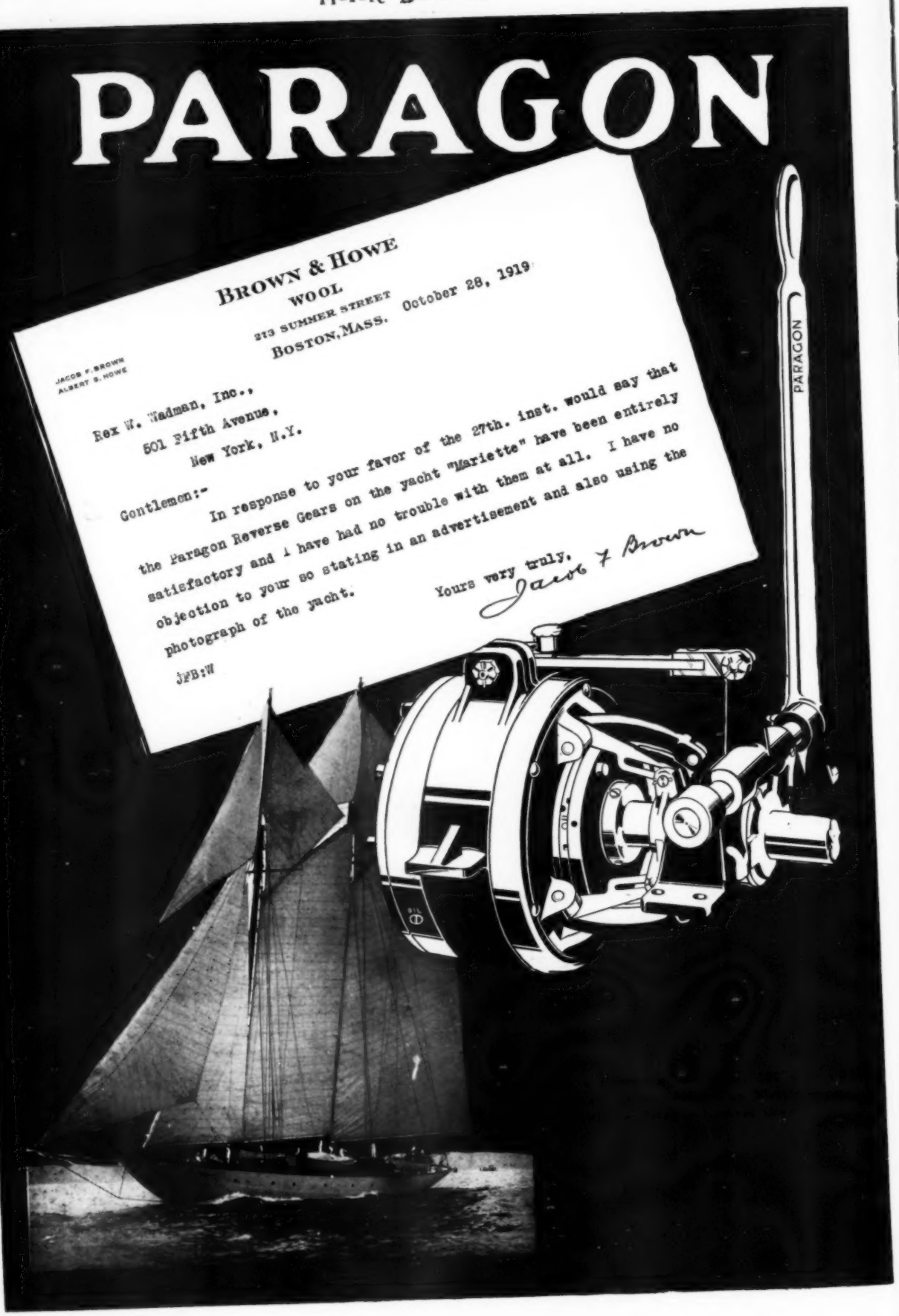
Rex W. Madman, Inc.,
501 Fifth Avenue,
New York, N.Y.

Gentlemen:-

In response to your favor of the 27th. inst. would say that the Paragon Reverse Gears on the yacht "Mariette" have been entirely satisfactory and I have had no trouble with them at all. I have no objection to your so stating in an advertisement and also using the photograph of the yacht.

Yours very truly,
Jacob F Brown

JFB:W



REVERSE GEARS

JOHN L. HACKER
NAVAL ARCHITECT
SPECIALIST IN HIGH SPEED CRAFT
[illegible] GRAND AVENUE
DETROIT, MICH.

Detroit, Oct. 28,1919.

Paragon Gear Works
Taunton, Massachusetts

Gentlemen:

We are sending you a photograph of Mr.Kemp's boat 'g'Everythin', winner of the ten mile free for all "Miller Chance Race"against a field of twenty four entries,creating a new Official A.P.B.A. displacement boat record of 36.3m.p.h. average for ten miles.

The "g'Everythin" was built by the Hacker Boat Co. and powered with a standard Hall-Scott L4-6 six cylinder marine engine. The engine was equipped with Paragon Reverse Gear and we feel that to a very large extent the complete satisfaction rendered by this boat to its owner has been made possible by the highly efficient service rendered by the reversing mechanism.

During the twenty years I have been designing and building boats I have advertently had a great deal of experience with the reversing mechanisms and I want to state for your information that Paragon Reverse Gears have uniformly rendered me a consistent, efficient and satisfactory service not equalled by any other gear with which I have had experience.

Very truly yours,

Hacker Boat Co.

John L. Hacker
President

PARAGON

PARAGON

CARLE P. CHARLTON
FALL RIVER
MASS.

Thursday
October Twenty-ninth
Nineteen Hundred, Nineteen

Mr. Rex W. Nadeau
901 Fifth Avenue
New York, N. Y.

Dear Sir:

Yours of October 27th in regard to Paragon Reverse Gears received.

It gives me great pleasure to inform you that I sold the Edamore II to the U. S. Government for the sum of $1.00 in April, 1917. She was in constant service for practically two years, covering over fourteen thousand miles, and was declared 95% efficient by the Navy Department.

She was returned to me in January of this year and has been in use during the present season.

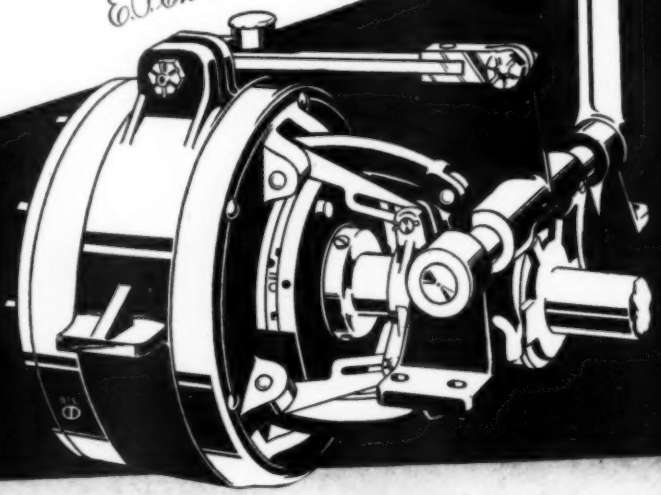
She is a twin screw boat and the Paragon Reverse Gears are the same as were installed in this boat in 1916, and I can highly recommend them.

You are at liberty to use this letter in any way you may choose.

Yours very truly,

E. P. Charlton

PARAGON



REVERSE GEARS

Osterville, Mass. Aug. 4, 1919.

Mr. J. A. Manning,
Sales Manager,
Knox Motors Associates,
Springfield, Mass.

Dear Sir:

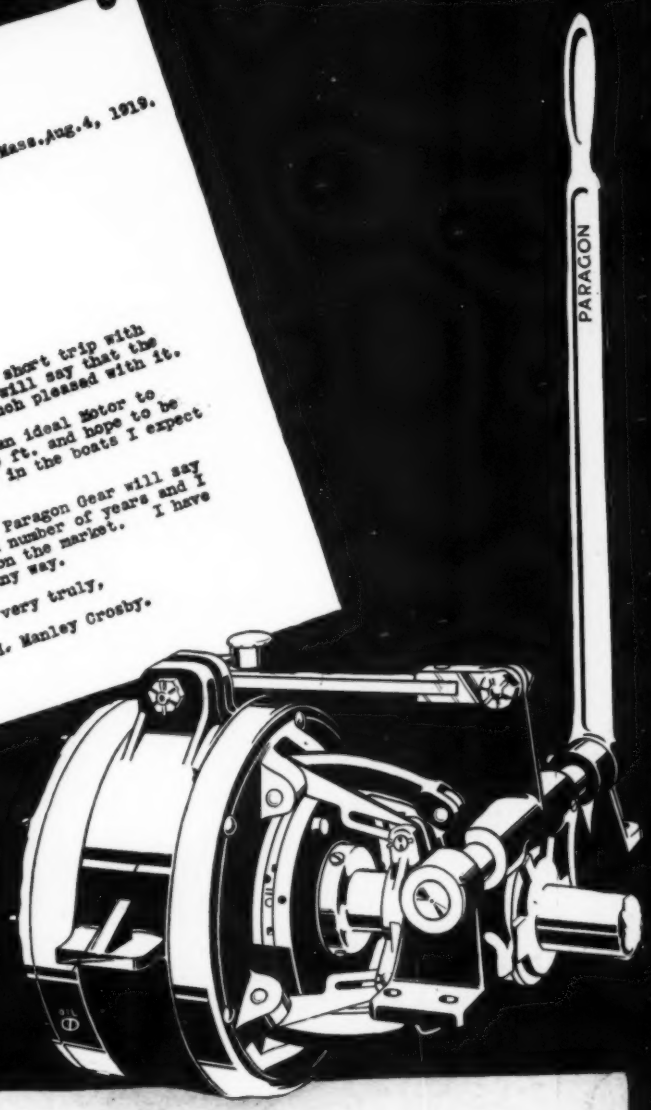
I am just back from a short trip with "Harriet" and the Knox Motor. I will say that the Motor ran very nicely and I was much pleased with it.

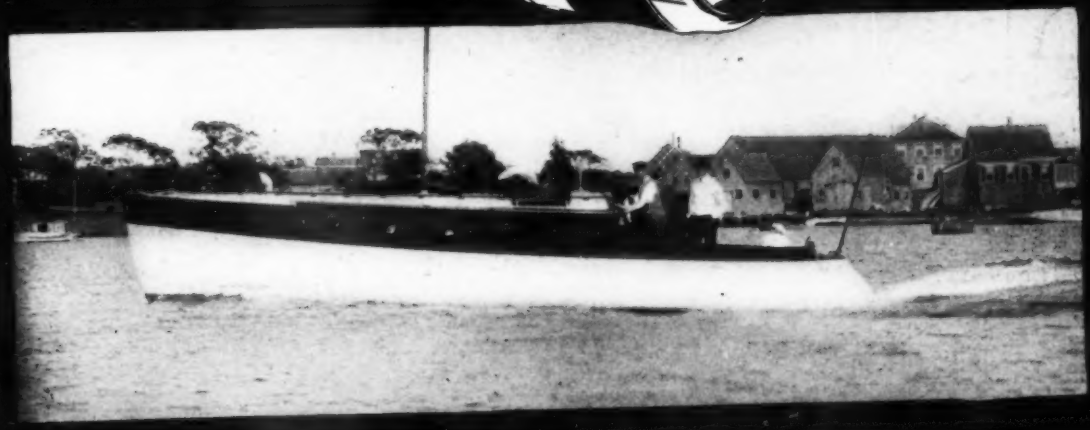
I believe you have an ideal Motor to power launches from 30 ft. to 50 ft. and hope to be able to use some of your Motors in the boats I expect to build for next season.

In regard to the Paragon Gear will say I have used these Gears for a number of years and I consider them the best Gear on the market. I have never known one to fail in any way.

Yours very truly,

H. Manley Crosby.





PARAGON

November 3, 1919
Long Branch, N. J.

Paragon Gear Works
Taunton
Massachusetts

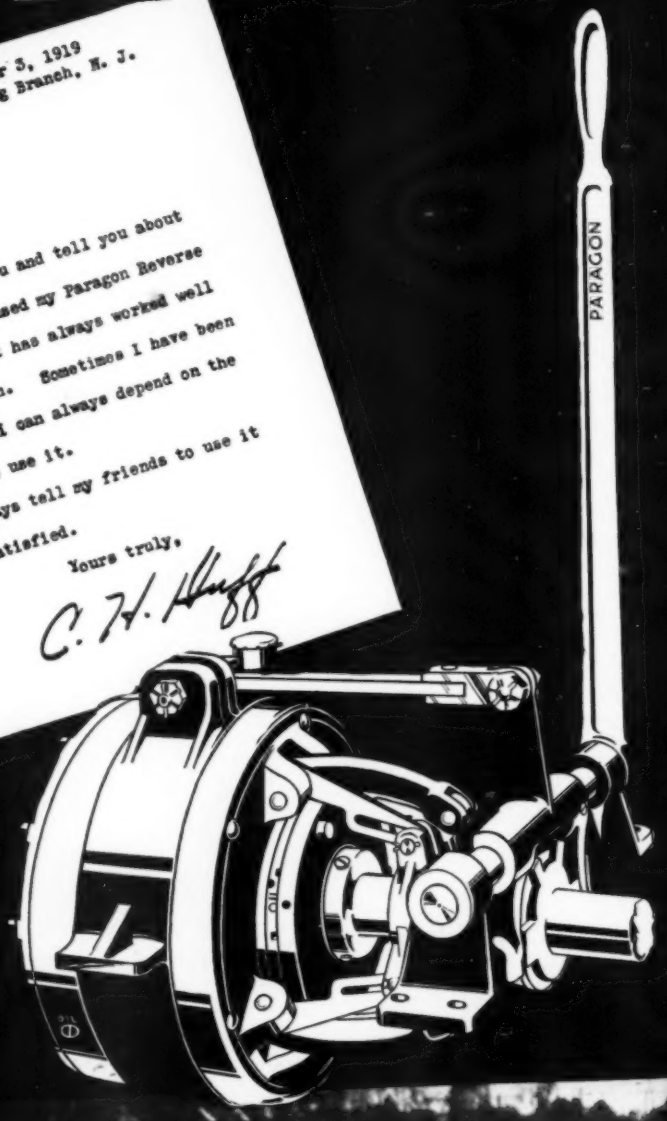
Sirs:

I want to write you and tell you about my Reverse Gear. I have used my Paragon Reverse Gear for four years and it has always worked well and given me satisfaction. Sometimes I have been out in bad weather and I can always depend on the reverse when I want to use it.

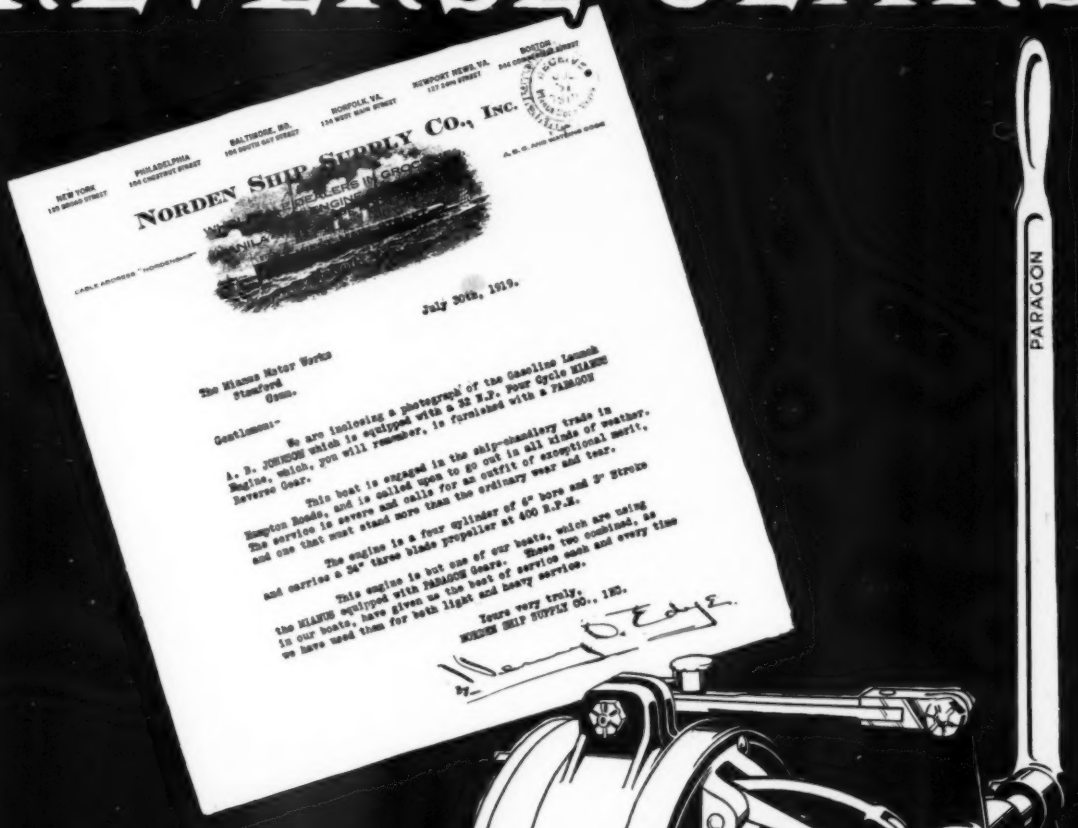
I will always tell my friends to use it as I am very well satisfied.

Yours truly,

C. H. Huff



REVERSE GEARS



NORDEN SHIP SUPPLY CO., INC.

July 30th, 1919.

The Miami Motor Works
Stamford
Conn.

Gentlemen:-

We are inclosing a photograph of the Gasoline Launch ... Engine, which, you will remember, is furnished with a PARAGON Reverse Gear.

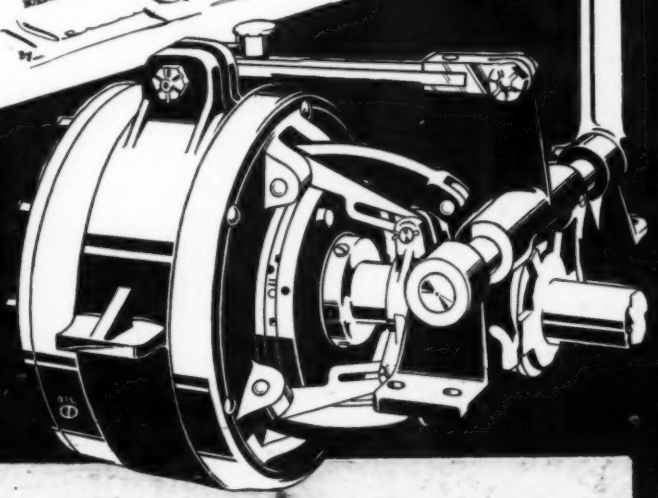
This boat is engaged in the ship-chandlery trade in Hampton Roads, and is called upon to go out in all kinds of weather. The service is severe and calls for an outfit of exceptional merit, and one that must stand more than the ordinary wear and tear.

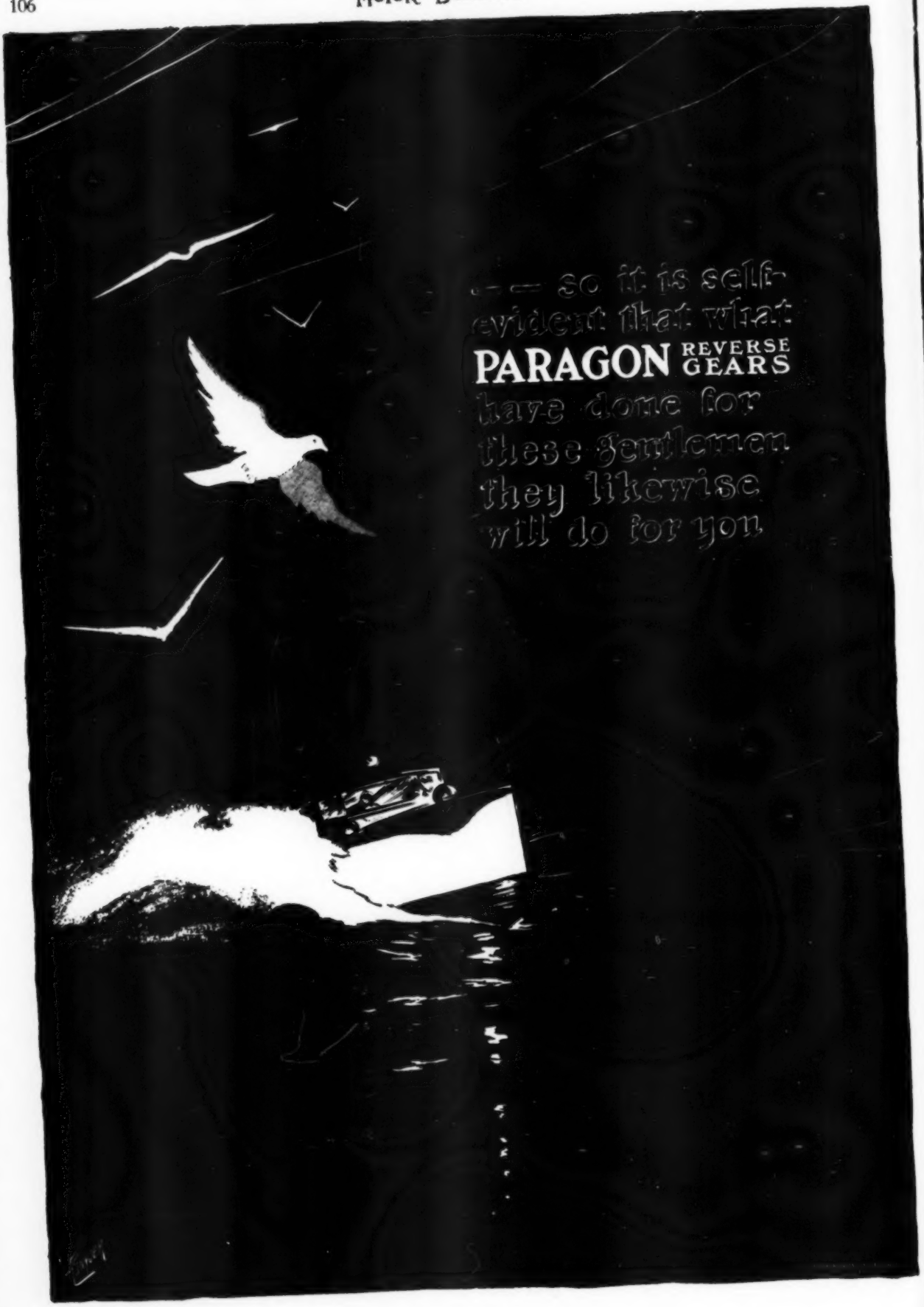
The engine is a four cylinder of 6" bore and 7" stroke and carries a 24" three blade propeller at 400 R.P.M.

This engine is but one of our boats, which are using the MIAMI equipped with PARAGON Gears. These two combined, as in our boats, have given us the best of service each and every time we have used them for both light and heavy service.

Yours very truly,
NORDEN SHIP SUPPLY CO., INC.

By




— — so it is self-evident that what
PARAGON REVERSE GEARS
have done for these gentlemen they likewise will do for you

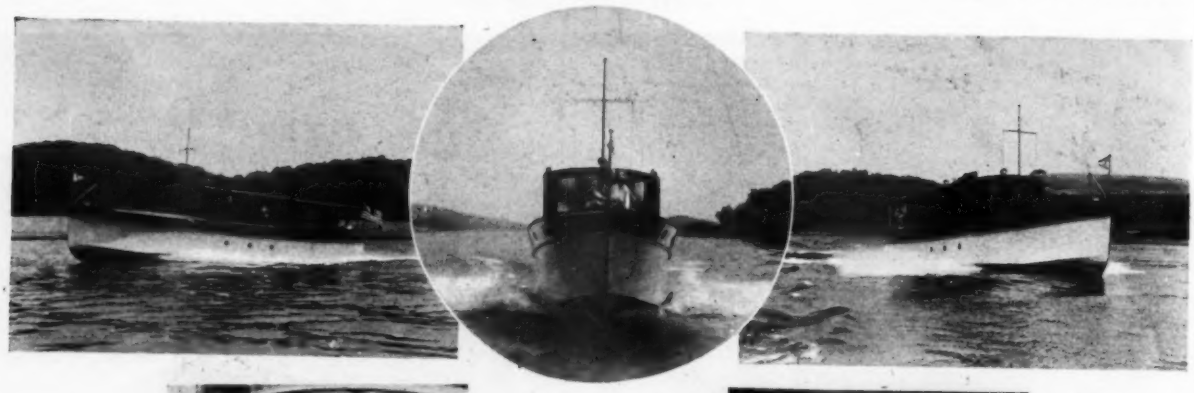
The Pleasure Craft of the Discriminating

Recent Deliveries of ALBANY BOATS have been made to

Mr. Joseph Wittman, New York City and Thousand Islands.
Mr. Burns Lyman Smith, Syracuse, N. Y.
Mr. Charles Soby, Hartford and New London, Conn.
Mr. J. F. De Castro, Havana, Cuba.
Mr. Emil Stray, Christianssand, S. Norway.
Mr. George F. Johnson, Endicott, N. Y., and Daytona, Fla.
Mr. Joseph F. McGowin, Mobile, Ala.
Mr. Nicholas F. Brady, New York City.
Mr. James Cox Brady, New York City.
Mr. R. C. Reynolds, Troy, N. Y. and Miami, Fla.
Mr. Franklin Coe, New York City.
Mr. M. Fernandez Blanco, Santiago de Cuba.
Mr. H. M. Baruch, New York City and Georgetown, S. C.

If you are interested in De Luxe Cruisers or Runabouts we shall appreciate the opportunity to give you full particulars. Immediate deliveries of Standardized sizes can be offered subject to inspection.

Albany Boat Corporation
Seventh Street
Watervliet, New York
(Near Albany)



OWNER'S CABIN looking aft. The folding beds closed make a big floor space for day time. Two additional beds on transoms each side of dresser.

GUEST STATEROOM looking forward. Reflection in full length mirror shows clothes locker at aft end of stateroom. Lazy backs swung from beams to form upper berths.

OWNER'S CABIN. looking forward, showing beds made up. Excellent springs and mattresses on these beds.

Albany BOATS

The Pleasure Craft of the Discriminating

50-ft. Albany Express Cruiser de Luxe

Finished in Mahogany and white enamel, the hangings of Kouri silk, the upholsterings Bellecourt velvet and the carpets neutral shades of Bigelow's best Wilton.

Equipped with powerful twin-screw motors with "one man control"; accessible installations, and completely ready for sea. Galley equipped with three-hole and oven range, large refrigerator, and provision space for extended cruise.

Of light draft and screened throughout for Southern service. To demonstrate how unusually light and well ventilated interiors are, we reproduce accompanying photographic pictures without customary retouching.

The utilization of space is remarkable, and a result of experience in standardizing. This Cruiser sleeps 8 people and crew of 2. Each cabin has toilet and ample lockers. Ten people dine comfortably. The crew operate the boat and serve the owner with minimum effort.

Its safety features are so unusual that a prominent insurance company quotes 40% lower premiums than customary—demonstrating a convincing expectation that the owner and his family will be safer on this 50-footer.

These are not blue print talks—see and judge this standardized boat on its merits.

Our 36 x 10-foot Cruiser is similarly standardized, but is intended to accommodate only four people for extended cruising.

Construction in advance of sale enables us to offer both 50- and 36-ft. new Cruisers for immediate delivery. Detailed specifications of the boat that interests you will be forwarded on request.

Other data regarding Albany Boats on preceding page.

Albany Boat Corporation

Seventh Street, Watervliet, N. Y.

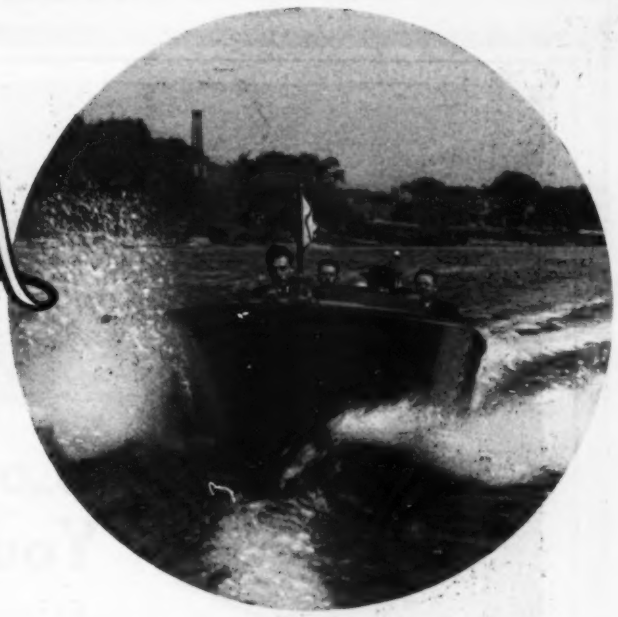
DINING SALOON, in deck house, looking aft to buffet and entrance to owner's cabin.

GALLEY looking to Port showing large refrigerator and range. Under the galley steps, starboard is a big stowage space.

DECK-HOUSE looking forward to controls and entrance to galley.

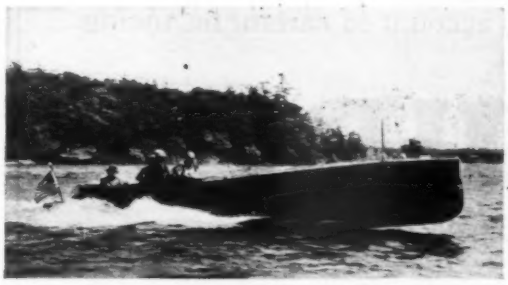
Advertising Index will be found on page 156

Albany BOATS



—the Pleasure Craft
of the Discriminating

Albany Mahogany Fast Runabouts



30-Foot Runabout

—an improved, modified V Bottom, dry, easy to handle and luxuriously comfortable mahogany runabout. It is now in its 7th year of standardization and is a well perfected boat,—handsome, comfortable and as speedy as consistent with seaworthiness and sturdy construction. It has new safety equipment and is throughout the boat a gentleman will trust for his family—the boat that ladies will drive and enjoy. Auto control—electric starting—lighting—7 or 9 passenger as ordered—choice of motors for speeds 28 or 33 m.p.h. A few deliveries available for winter use South.

26-Foot Runabout

—is a special boat for comfort particularly to attain practically a noiseless outfit. Throttles down to 2 m.p.h. or opens up to 21 m.p.h. Auto control and almost human in its response to controls. Cedar planked, mahogany trim, electric starting-lighting—7 passenger. A splendid type of boat for restful driving for those to whom high speed is not essential. One delivery will be available for Florida.

Special Runabouts

We design and build all sizes of Fast Runabouts, Sedans and Coupe Yacht Tenders—all of fine workmanship and smart appearance.

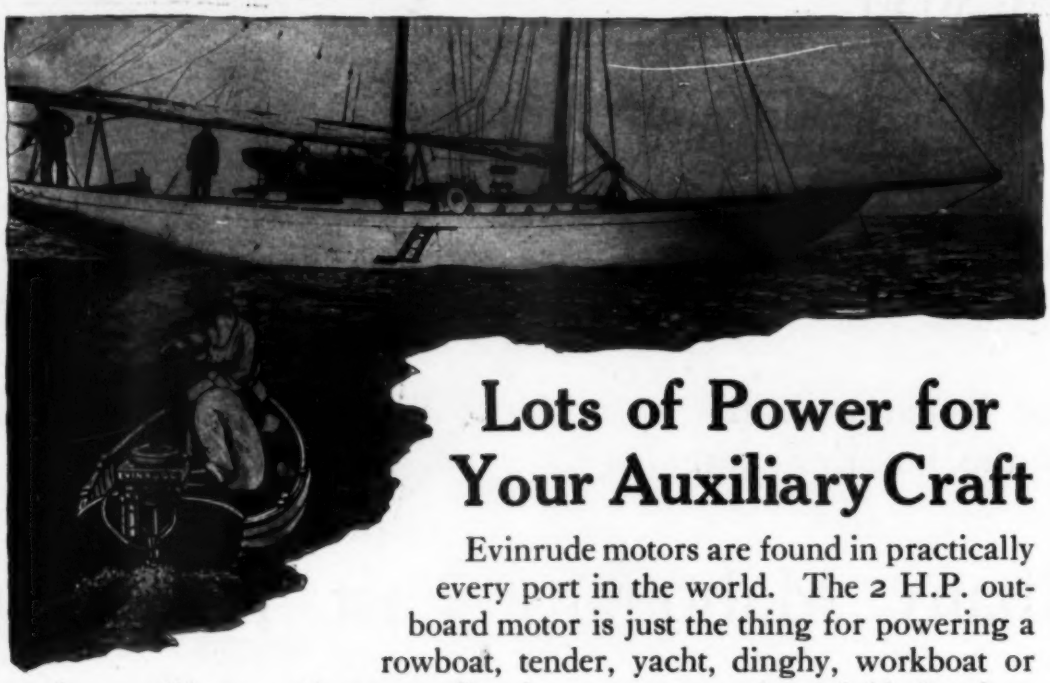
Our leadership in this line of work came about through setting aside a Department and training men exclusively for fast runabout types—no repair work, no diversifying. We avoid freakish and unsafe types.

1920 holds promise of unusual interest in runabout class, notably in high speed, practical models as stipulated by Carl Fisher Trophy. If interested in Fisher Trophy Races ask for special data when writing; such data will be furnished only to responsible people.

Our building in advance of sale permits you to see, examine and test boats before purchasing for immediate delivery. Detailed Specifications of boat that interests you will be forwarded on request.

Albany Boat Corporation

Seventh Street, Watervliet, N. Y.



Lots of Power for Your Auxiliary Craft

Evinrude motors are found in practically every port in the world. The 2 H.P. outboard motor is just the thing for powering a rowboat, tender, yacht, dinghy, workboat or other small boat. Almost no vibration on account of careful balancing. The 1920

EVINRUDE

Detachable Motor for Watercraft

has special built-in-flywheel magneto and automatic reverse. Simple speed lever insures perfect control of boat. It drives a rowboat 6 to 8 miles an hour and operates with very little fuel cost. It is a standard outboard motor adopted by 25 governments and with more than 100,000 in actual use.

2-Cylinder Inboard Motor

A light, speedy 5 H.P. motor for launches, tenders, workboats, fishing boats. A simple means of furnishing auxiliary power for sailboats. On a canoe this motor will make a speed of 12 to 13 miles an hour. Cylinders are cast en bloc. Deliveries begin March 1st. Also single cylinder inboard—2 H.P.—deliveries now.

A Quick Convenient Bilge Pump

The Evinrude Centrifugal Pump makes a short job of pumping a water-logged boat or scow. Pump and motor are in one unit. Just start the motor and drop the Evinrude pump right into the water. It will pump 4,200 gallons an hour. Grit and sand can't choke this pump.

Write for catalog describing the complete line of Evinrude Motors and for special circular describing the Evinrude Centrifugal Pump.

EVINRUDE MOTOR CO., 208 Evinrude Bldg., Milwaukee, Wis.

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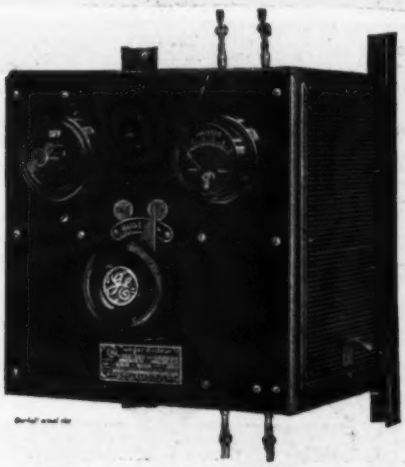
Tungar
RECTIFIER



Yacht Club Type Tungar Rectifier
6 amp. 75 volts

A Longer Life for Your Battery

Motor starting and boat lighting make up about the hardest service a storage battery has ever been asked to withstand. No wonder lights grow dim, motors won't start, batteries die young. Overwork without recharging will kill any battery quickly.

Every battery needs a *boosting* charge occasionally, a slight overcharge at a low rate to keep the plates in good condition. It isn't safe to adjust your generator for this overcharge—it already charges as fast as the battery can stand. It is a nuisance to carry the battery inland for charging.

You can save your battery and your pocketbook, by using a Tungar Rectifier at least once a month. It is a low priced efficient battery charger, which operates from any alternating current lighting circuit. Connections can be arranged for charging the battery without removing it from the boat.

Private Boat House Type Tungar
6 amp. 15 volts.

Tungar should be installed in every private boat house, yacht club and repair station. It saves its cost quickly.

Write today for prices

General Electric Company

General Office
Schenectady, N.Y.

Sales Offices in all large cities

85A-37

HY PROPE

Made in Maine

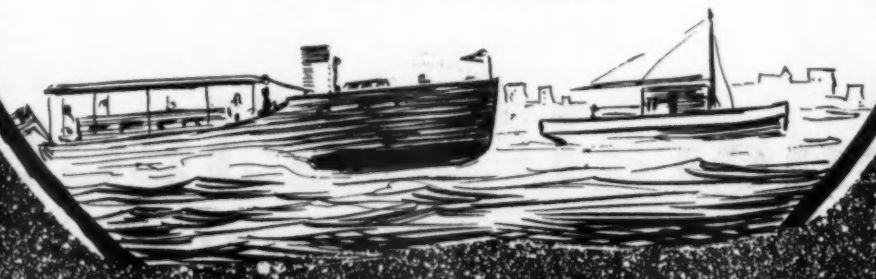
Used throughout the World

That is the evidence in favor of

HYDE TURBINE TYPE PROPELLERS

We are located in Bath, Maine, a city known throughout the nation as the original Shipping City of the United States. Is it any wonder that we know the requirements of the marine trade? Our coasts are inhabited by that sturdy race that follow the sea, and we have for years catered to their requirements. We know that when a boatman wants a propeller, he wants a *dependable* propeller—one that will stand hard usage but at the same time will operate efficiently and will give value received for every drop of fuel consumed.

Such is the HYDE



Advertising Index will be found on page 156

DEALERS

We have never attempted to see how *CHEAP* we could make

HYDE TURBINE TYPE PROPELLERS

but have strained every effort to see how *good* we could make them. Hyde propellers are correctly designed. They are made of the highest grade manganese bronze, and we are so sure of its strength that we will replace any Hyde wheel that is broken while in use. The workmanship is unexcelled. Hyde Propellers, therefore, deliver maximum thrust and are adapted to use on any kind of installation.

Catalog and data sheet upon request.

HYDE WINDLASS COMPANY

BATH, MAINE **U. S. A.**

TRADE MARK

"COES"

REG. U.S. PAT. OFF.

The Back-bone of Coes Wrench Company is SERVICE

The back-bone of a COES WRENCH is our guarantee of service to you. A bolt will break before a COES—and you don't need gloves to prevent skinned knuckles. A COES won't slip.

You pay 5 per cent more for COES than you pay for others but—they'll outlast two others. That's SERVICE.

48" Key Model Wrench. Weight 62 lbs. Opens 9¼ inches

4 feet is the Giant—6 inches the Midget. The COES family covers every size between. They're all Giants in strength.

In your kit or on the bench, on board ship or in the plant, you won't get SERVICE till you equip with COES Wrenches.

We want to tell you about our wrenches. Send your name and address for your COES Catalogue.

Of any reputable hardware dealer, or

COES WRENCH CO. Worcester, Mass.

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Every Knot At Least Cost

THE Quayle OIL BURNING Marine Engine

Has-No

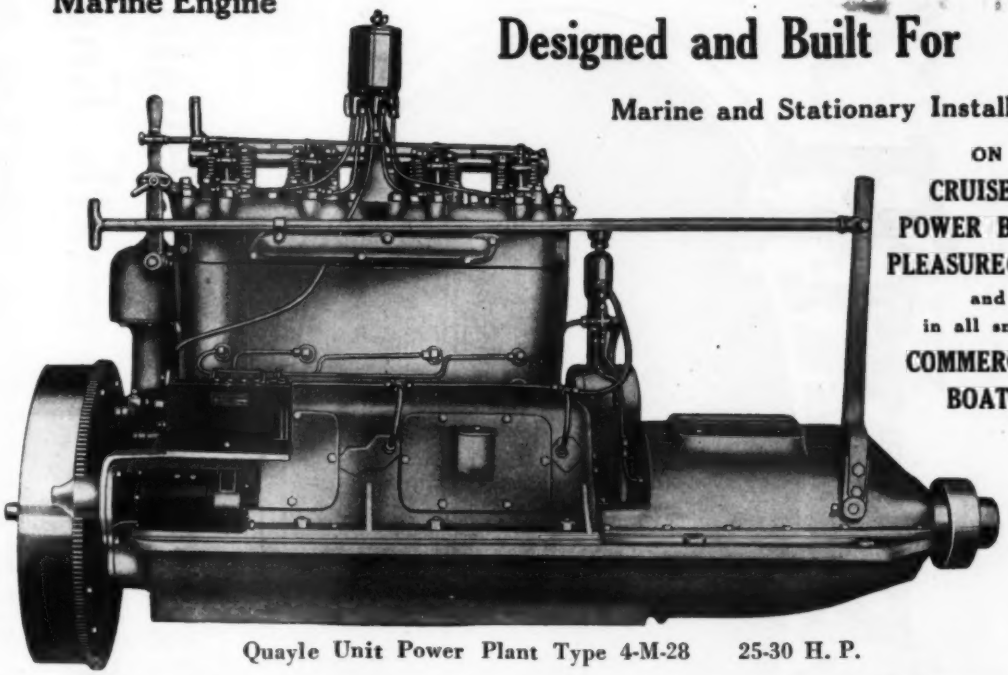
CARBURETOR
MAGNETO OR BATTERIES
SPARK PLUGS OR POINTS
COILS OR TIMERS
HOT TORCH OR—
HOT TUBES OR PLATES
HIGH DUTY COMPRESSOR
OR FUEL PUMP

Designed and Built For

Marine and Stationary Installation

ON

CRUISERS
POWER BOATS
PLEASURECRAFT
and
in all small
COMMERCIAL
BOATS



Quayle Unit Power Plant Type 4-M-28 25-30 H. P.

Burns Any Free Flowing Oil

The Quayle will burn any of the heavier free flowing oils (Kerosene-Polar-Vegetable-Fish or Fuel Oil). It will consume less than one-half the quantity of fuel used by ordinary marine engines burning gasoline.

Fuel oil costs about one-third less than gasoline—burning less than one-half the quantity, the fuel cost of Quayle operation, therefore is about one-sixth that of the gasoline type marine engine.

Even when a Quayle installation requires discarding gas engine equipment—this remarkable low cost of operation makes it a dominant factor as a sound investment.

The Quayle type 4-M-28 is the finest proven internal combustion marine or stationary engine in the world today.

Its unique sturdy foolproof construction makes it a highly efficient and reliable source of power even under the most adverse operating conditions.

Your inquiry directed through our general offices in Chicago will give us an immediate opportunity to send you complete information on the Quayle Oil Burning Engine.

MANUFACTURED BY AND IN THE SHOPS OF

Commonwealth Motors Company

GENERAL OFFICES—CHICAGO FACTORIES—JOLIET, ILL., U. S. A.

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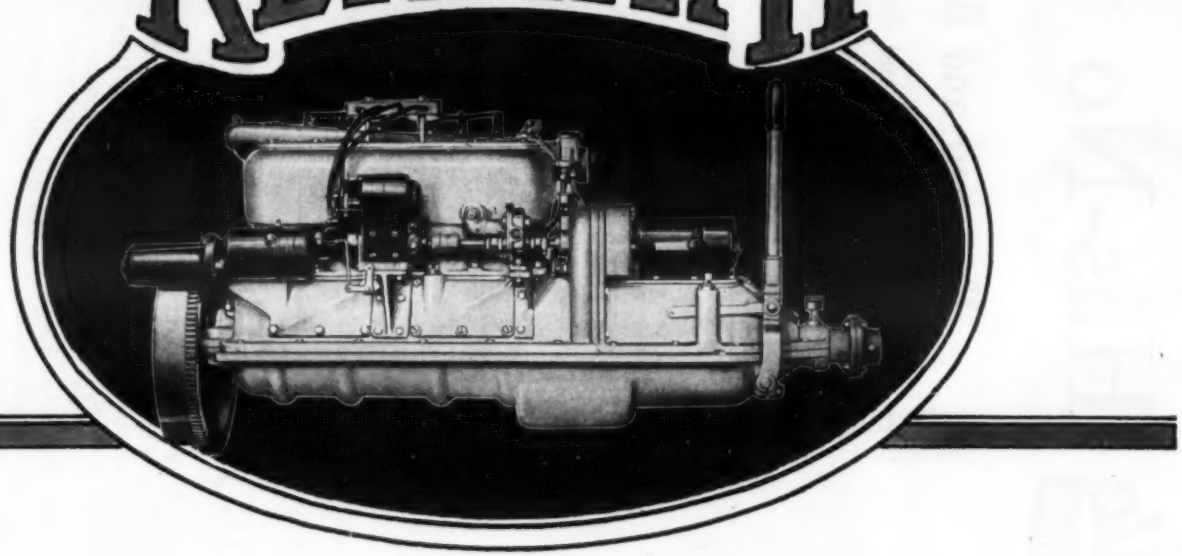
KERMATH



Men Who Use Boats for Business Are Strong for the Kermath Engine

The Kermath Can Always be Depended Upon: Upkeep Costs Are Remarkably Low and the Kermath Has Longer Life Than Most

FOR several years now there has been a steady, persistent increase in the demand for Kermath Engines among men who use a boat for business.

Here is where real motor efficiency shows up in dollars and cents and men show a disposition to get the real facts about an Engine before they put their money in it. The Kermath Engine, is *standard equipment* with more than sixty per cent of all the boat builders of the world. They select the Kermath because of its wonderful service, its low first cost; its very low upkeep costs, and the freedom from repairs.

They want their boats to be *right*—and so they are naturally critical about the Engine they install.

Kermath Engines use only about half the fuel usually required.

Vibration is cut down to the minimum—insuring less wear and tear on the engine; longer life and freedom from repair bills. If you are interested in an engine for a business boat, get the facts about Kermath Engines.

Your forethought and critical buying standard will pay you big dividends.

You'll spend less money for repairs and you'll get steadier, more consistent service from your boat.

The man who can sell you a Kermath Engine is a man worth knowing.

Prices $400 to $550.

Write for Interesting Circular Which Gives
Full Information About Kermath Engines

Address, Department "D"

KERMATH M'f'g Co.
DETROIT MICHIGAN.

When writing to advertisers please mention MOTOR BOATING, *the National Magazine of Motor Boating*

GEO. B. CARPENTER & CO.
MARINE SUPPLIES
CHICAGO

1920

THE world's transition to vastly better things is now taking place. It is more than readjustment: it is reconstruction from the foundation up. In adapting ourselves to these changes we shall make a great mistake if we do not give a large place in our plans to — RECREATION.

The world is getting back to its work; which means that the world must also get back to its play.

The call of the water is going to be stronger than it ever was before. All of the old hands will be back in the game, and with them will come thousands of new enthusiasts who had their first taste of the sea in war.

While material and labor are as scarce as they are at present we would urge everybody concerned in boat construction and operation to be forehanded and place orders as soon as possible for whatever they will require in

Marine Supplies

That has been our business since 1840. Our new CATALOGUE is in preparation and will present some novel features which we believe will be of service to you. It will be issued about January 1st, 1920. Send in your name now and make sure of your copy. Ask for catalogue 625.

GEO·B·CARPENTER & CO

200 W. Austin Ave. Chicago, Illinois

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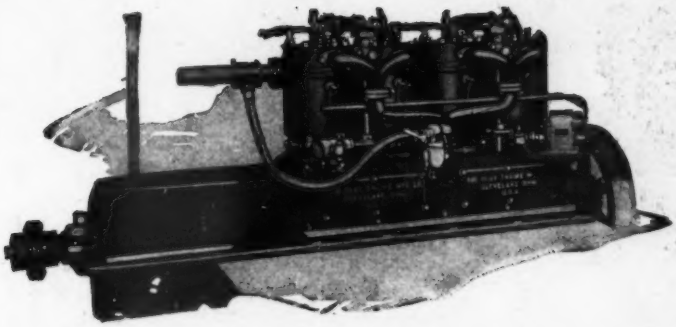


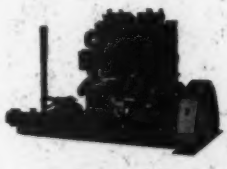
HONEST CLAY ENGINES

SINGLE CYLINDER MODEL
Built in 6, 8, and 10 H.P. Sizes

Twenty-one years of honest service and thousands of honest Clay Engine owners prove our claims.

An Honest Clay Engine is the best engine you can put in your boat. When you own a Clay then you will have power to spare—a motor that will save you money in operation, a motor too simple to give you trouble, a motor that will take you out and bring you home. The Honest Clay is a four cycle motor and operates on gasoline, kerosene or distillate.

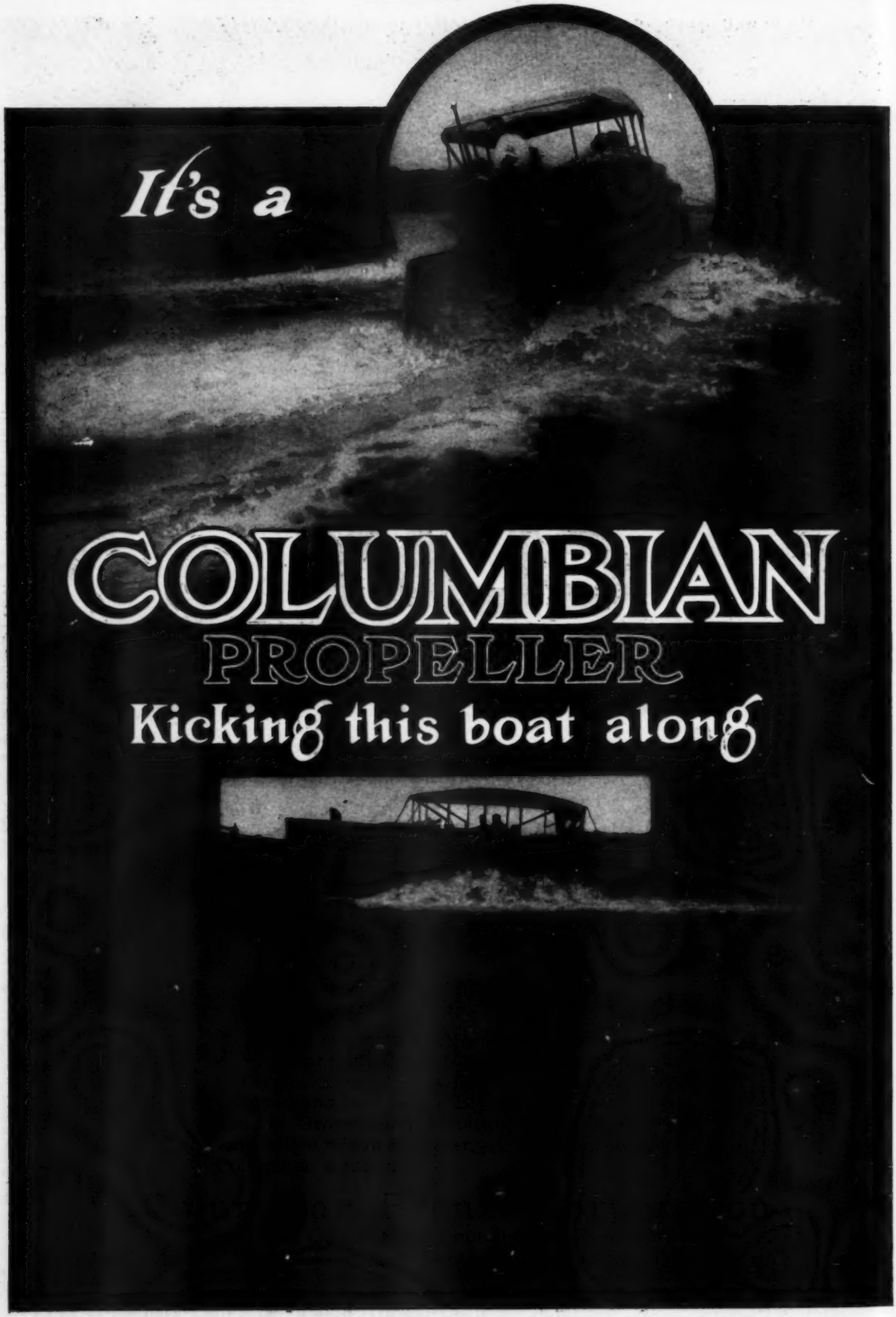
Better send today for all particulars.



DOUBLE CYLINDER MODEL
Built in 12-14; 16-18; 20-22; 40-50 H.P. Sizes

THE CLAY ENGINE MFG. COMPANY

664 East 72nd Street Cleveland, Ohio



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Announcement

J.V.B.

THE mark of a new engine designed and built by the Master Designer of them all

JOSEPH VAN BLERCK

An engine into which he has concentrated everything he has learned during the past twenty years in which he has been designing and building power plants for boats. A four cylinder, over-head valve powerful and complete engine supplying from 35 H.P. up to 60 H.P. and weighing 1,150 lbs. Completely equipped to every last little detail with all accessories unbuilt and forming an integral part of the unit—not just tacked on as an afterthought.

Sold just one way—*complete*. Regular equipment includes self contained reverse gear of the sliding pansmission type; two unit electric starter with battery, high tension magneto, etc. and the price is

$1,000.00

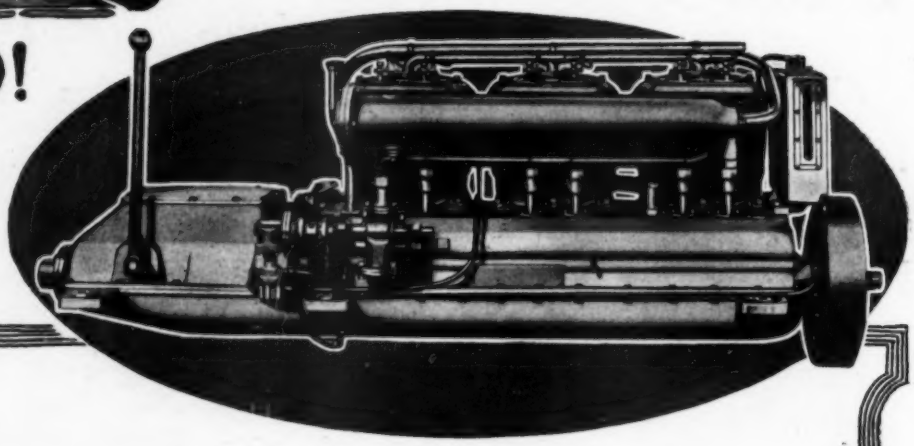
A remarkable price for a remarkable engine designed by a remarkable man.

A bulletin just off the press describes and illustrates this unique motor in detail. Write or write for it. It is very easy.

THE
J. V. B. ENGINE COMPANY
931 South High St., AKRON, OHIO, U.S.A.
Eastern Sales Office, 1776 Broadway, New York City

POWER!

SPEED!



What a Man Wants When He Buys a Motor-Boat

"WISCONSIN"
Power Tested by Dynamometer

The power output of every WISCONSIN Motor is certified with an electric dynamometer. Each must deliver its specified horse-power before it is passed by an inspector.

Wise men look for more than power and speed when they choose a motor-boat or launch. They want durability—service that does not have to be *coaxed*—every-day utility that can be depended upon without constant "tinkering" and costly adjustments.

Because they are *ready to run* when they leave the shops—operation-perfect down to the last bolt and nut—

Wisconsin Motors

run cleanly, quietly and smoothly from the start. They save money for the *dealer* by eliminating "service" costs, and for the *boatowner* by their uninterrupted, perfect performance.

The slightly higher initial cost of a Wisconsin Motor is more than justified by "Wisconsin" quality—every moving part adjusted—every bearing run-in—every cylinder ground accurately to size and every piston fitted perfectly.

Write for details and specifications.

WISCONSIN MOTOR MFG. CO.
Station A, Dept. 302 **MILWAUKEE, WISCONSIN**

DISTRIBUTORS:
NEW YORK BRANCH: T. M. Fenner, Factory Representative, 21 Park Row, New York City, N. Y.
CALIFORNIA DISTRIBUTOR: Earl P. Cooper Co., Los Angeles, Cal.
NORTHWEST DISTRIBUTOR: Chandler-Dunlap Co., Seattle, Wash.

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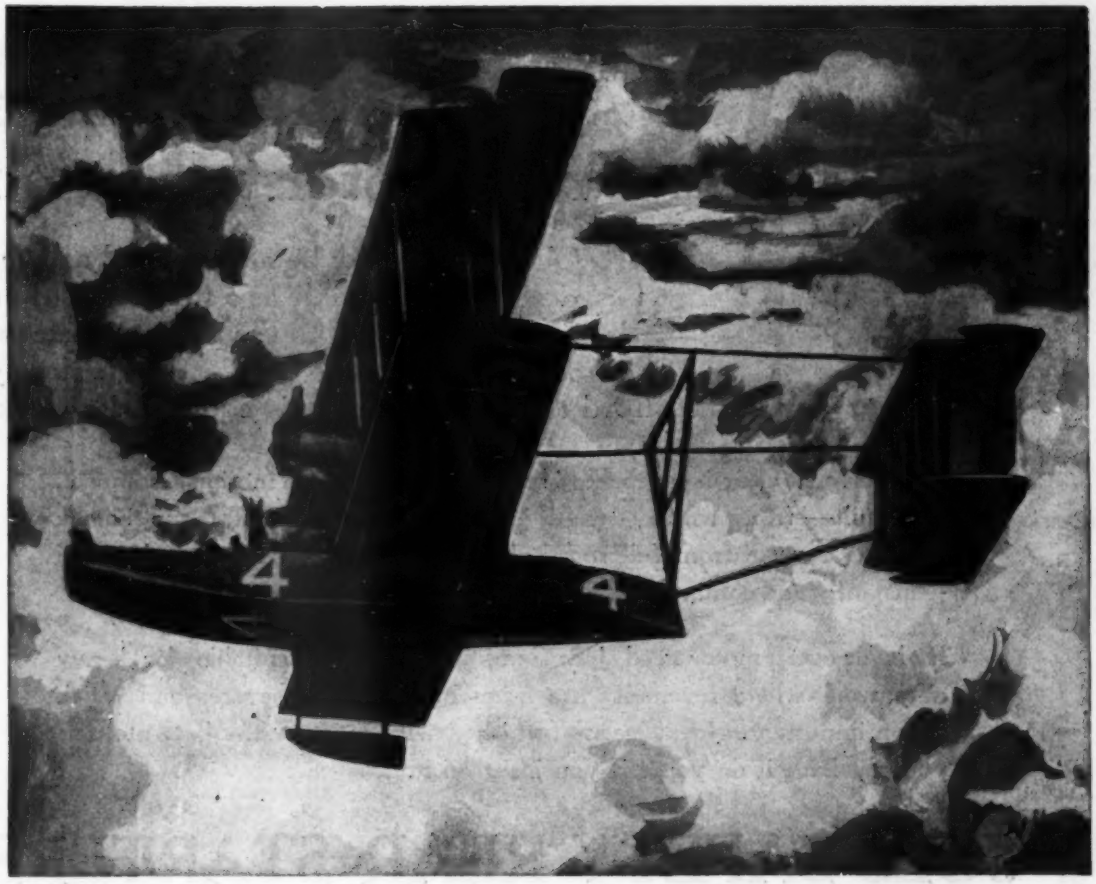


THE indorsement of GULF LIBERTY AERO OIL by the United States Navy in using it for the NC-4 flight should be conclusive proof of the efficiency of Gulf Products.

SUPREME AUTO OIL

is manufactured from the same crude base—in the same refinery—under the same conditions—and gives the same efficient lubrication in boating motors.

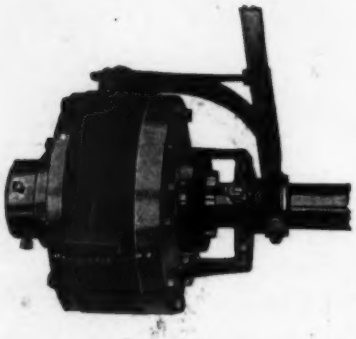
GULF REFINING COMPANY

General Sales Offices: PITTSBURGH, PA.

District Sales Offices:

NEW YORK PHILADELPHIA BOSTON
ATLANTA NEW ORLEANS HOUSTON

THERE IS *MORE POWER* IN THAT GOOD GULF GASOLINE AND SUPREME AUTO OIL
Manufactured by Gulf Refining Company Pittsburgh, Pa. U.S.A.



A Reliable Bridge From Motor to Motion

YOUR motor may be as powerful as ever designed, as flexible as a fine disposition, but none of this gets to the propeller except through the reverse gear. Which simply means that you can't afford **any** gear unless it is equal to its work.

Joes Reverse Gear is a reliable "bridge" from motor to motion—compact, well built—strong where strength is needed and equal to all requirements. You can reverse from full speed ahead to practically full speed astern —instantly and continually. Power always under perfect control.

Built for every motor need, Joes Gears are especially suitable for heavy duty work where reversings are frequent, the strain severe, and quick action important. Joes Gear is furnished with most of the best motors; you can have it on yours if you **insist on it.**

JOES SAFETY REAR STARTERS

"NO KICK BACK" of the motor can injure the arm that cranks with Joes Safety Rear Starter. Thousands in use. Noiseless Ratchet. Strength, adaptability and efficiency among its strong points.

"ONE WAY" CLUTCHES. A low price clutch for fishermen's use; also a very light powerful clutch for high speed, or for any transmission where great power is required in small compass.

Write for Catalog

The Snow & Petrelli Manufacturing Co.

156 B, Brewery Street - - - New Haven, Conn.

Manufacturers of JOES Reversing Gears, One-Way Clutches, Safety Rear Starters

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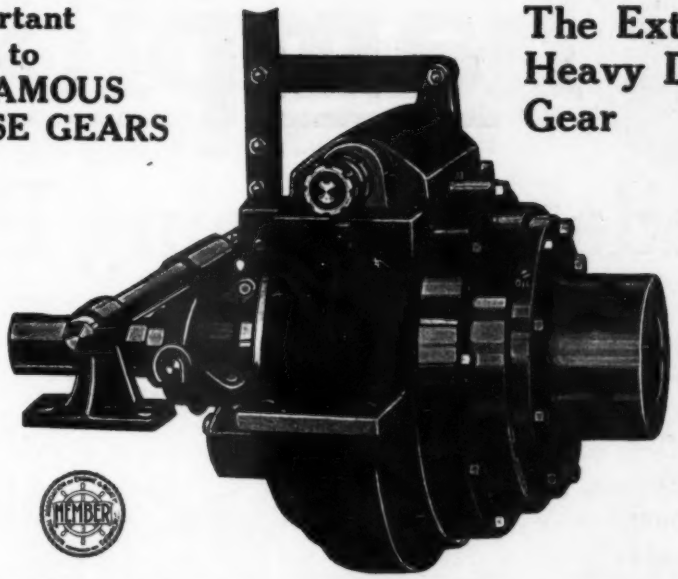
An Important Addition to JOES FAMOUS REVERSE GEARS

The Extra Heavy Duty Gear



JOES HUSKY GEAR

Especially Adapted to Oil Burning Motors and Work Boats

HERE'S a Big Husky Heavy Duty Reverse Gear adapted to heavy duty motors and work boats, where hard and continued service is of vital importance.

A Few Strong Points:

High Ratio of Reverse Speed: If you want action on the reverse gear get a **Husky Joe** and you will get a reverse speed ratio of about 85 per cent. Compare this with other gears.

Double Internal Gear Reverse: The strongest and most reliable type of transmission gearing known to science.

Suspended Brake Band: Which eliminates all drag on the gear drum when running ahead, as well as side thrust when reversing.

Improved Centrifugal Lubrication: Which insures perfect lubrication of all bearings.

Assured Neutral Position: Which is not destroyed by centrifugal action.

Send for Literature

The Snow & Petrelli Manufacturing Co.

156 B, Brewery Street - - - New Haven, Conn.

Manufacturers of JOES Reversing Gears, One-Way Clutches, Safety Rear Starters

Agents: J. King & Co., 10 Church Row, Limehouse, E. London, England; Pacific Marine Engine Co., Seattle, Wash.; W. E. Gochenaur Mfg. Co., 631 Arch St., Philadelphia, Pa.; A. R. Williams Machinery Co., Toronto; Sutter Bros., 44 Third Ave., New York City, Service Station Foot of East 92nd St., Brooklyn, N. Y.; Arendahl Motor & Machine Co., Arendahl, Norway.

Champion

Dependable Priming Plugs

Have a "Summer Motor" In Zero Weather

YOU do not have trouble starting your engine in warm weather. Why have it in winter?

Get a set of Champion Dependable Priming Plugs that put the gas into the cylinders at the *right* place. It trickles down the plug core and enters right at the sparking point. With the gas exactly where the spark jumps, the explosion is instantaneous and sure. They are better than priming cups, and for every one of the hundreds of thousands of motors that do not have priming cups, they are imperative.

All dealers sell Champion Dependable Priming Plugs. The price is $1.50 each.

Champion Spark Plug Company, Toledo, Ohio

Champion Spark Plug Company, of Canada, Ltd., Windsor, Ontario

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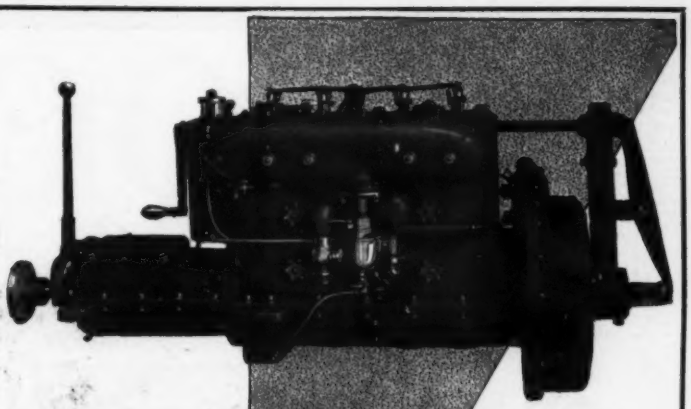
One of these Will Meet Your Needs

Somewhere in the line of Lockwood-Ash Marine Engines is one that will meet your needs.

From the clean-cut, sturdy 2 h.p. outboard engine to the big four-cylinder power plant are varieties in size to cover a wide range of power and speed requirements.

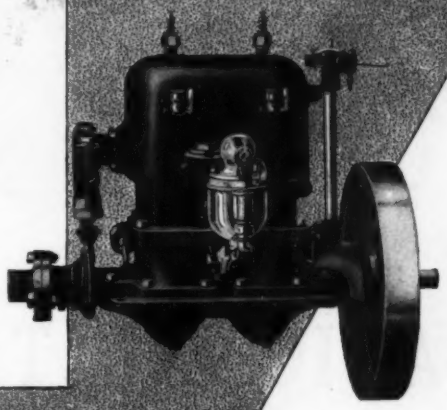
Fourteen years of experience enable Lockwood-Ash officials to act as your consulting engineers in boat engines.

Prompt and serious attention to every inquiry is a Lockwood-Ash rule.



4-Cylinder 4-Cycle

Big brother of the Lockwood-Ash Engine family, a highly developed marine power plant. Rugged and dependable. Delivers up to 20 h. p. Built with or without rear starter.

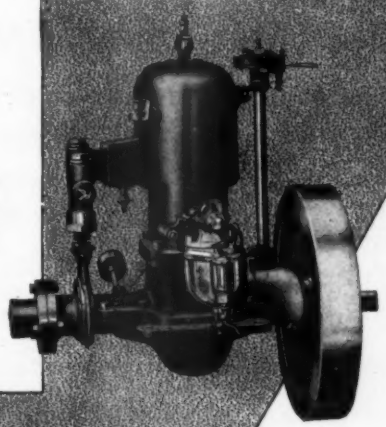


2-Cylinder 2-Cycle

A light, compact all-purpose engine, of few parts and readily accessible. Made in three sizes, 6- 8-and 12-h. p. The largest size should deliver up to 15 miles per hour.

1-Cylinder 2-Cycle

A simple, dependable in-board engine for work or pleasure. Easy to start; easy to operate and care for. Made in 2½ and 4 h.p. sizes.



Outboard Row Boat Engine

This portable, 2 h. p. engine is a favorite for both pleasure and work. Easily attached to a row boat. Full of pep and thoroughly reliable.

Why Lockwood-Ash Engines Are Worthy of Your Choice

Lockwood-Ash Marine Engines are products of an institution which always has placed quality first. Experience has pointed out the sizes that make up the well-selected line and the quality standard has dictated the thorough workmanship which is in every Lockwood-Ash Engine.

Lockwood-Ash Engines are mechanically sound—not experiments. They are built simple in principle and strong in practice.

Ask for the Booklet

Ask for the booklet that tells all about Lockwood-Ash Engines. Also ask about the 30-day trial plan.

LOCKWOOD-ASH MOTOR CO.

1901 Horton Avenue
JACKSON, MICHIGAN

LOCKWOOD-ASH
MARINE LA ENGINES

(53)

INTERNATIONAL THIRTY-TWO

The Prettiest and Finest Built Boat Afloat

Never again will you have to envy the other boatman's boat.

When we designed the International Thirty-two we had but one object in view —to turn out the best boat both in construction and design it was possible to build regardless of price. Marine critics were astounded when they saw the result and more so, when they saw the low price of the boat.

You'll find other thirty-two footers, but you won't find the comfort, beauty and value the International Thirty-two gives you.

Buy Now and Be Ready for the Coming Season.

We knew we would sell the International Thirty-two but the demand is increasing even beyond our hopes. We can produce them in large numbers but they're selling fast. Order your boat now. When Spring comes we'll deliver it to you with beautiful cushions, lights, anchor and even the rope to tie up with. When you receive your boat just put gasoline and oil aboard and you're ready for your first cruise. Fverything for your personal comfort is on board.

INTERNATIONAL
SHIPBUILDING AND MARINE ENGINEERING CORPORATION
NYACK, NEW YORK, U.S.A.

Advertising Index will be found on page 156

$3,500 for a Thirty-Two Foot Cruiser With Every Convenience

SPECIFICATIONS

Hull—Keel, stern shaftlog, deadwood, frames, floor timbers, beams, of white oak.

Planking—$\frac{7}{8}$" Douglas fir, single lengths.

Floors and Decks—White pine.

Cockpit Finish—Mahogany.

Cabin—White enamel and mahogany—full head room.

Fastenings—Galvanized iron.

Power Plant—Kermath motor twenty horsepower, four cylinder, four cycle, with electric starter and generator.

Seamless steel gasoline tanks with high grade strainer.

Electric Lights in cabin and cockpit.

Plumbing—J. L. Mott & Company fixtures.

Propeller—Columbian Rocket, three blade bronze.

Equipment—Completely equipped ready to place linen, bedding, dishes, and gasoline on board and go.

Speed—Ten statute miles per hour.

INTERNATIONAL
SHIPBUILDING AND MARINE ENGINEERING CORPORATION
NYACK, NEW YORK, U.S.A.

CUT RATE
MARINE SUPPLY HOUSE

Everything for Motor Boats

Catalogue Mailed Free

E. J. WILLIS CO.

85 Chambers St., New York City

Advertising Index will be found on page 156

Universal **The Motor of Motors**

IT COVERS A WHOLE FIELD OF ITS OWN

Thousands of Universals are doing wonderful business in pleasure, work, and fishing boats.

It's the only Motor for boats up to 30 ft.

Send for Bulletin No. 29 direct to the Company or its Distributors.

UNIVERSAL MOTOR COMPANY
OSHKOSH, WIS., U. S. A.

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Johnson Joseph & C. M. Joslyn & Co., San Francisco, Calif.
McCoy Brothers, Daytona, Fla.
W. M. Harley, Ft. Myers, Fla.
Gibbs Gas Engine Co., Jacksonville, Fla.
W. L. Masters & Co., Chicago, Ill.
Shado Motor Boat Co., Davenport, Iowa
John C. Jago, Waterloo, Iowa
M. Horning, Dubuque, Iowa
Menge Marine Hdw. & Supply Co., New Orleans, La.
Unger & Mahon, Baltimore, Md.
Toppan Boat Mfg. Co., Boston, Mass.
Jesiek Boat Co., Grand Rapids, Mich.
Belle Isle Boat Company, Detroit, Mich.
Valley Boat Co., Saginaw, Mich.
Star Boat Co., Kansas City, Mo.
White River Boat Co., Branson, Mo.
George N. Varney, The Weirs, N. H.
Bowler Holmes & Hecker Co., New York
Hutchinson Brothers, Alexandria Bay, N. Y.
G. M. Richardson, Saranac Lake, N. Y.
Albert Mitchell Wilbor, Watertown, N.Y.
George & Bliss, Lake Placid, N. Y.
E. M. Landis Co., Toledo, Ohio
Oregon Marine Fisheries & Supply Co., Portland, Ore.
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Adrien Sizer, Washington, D. C.
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Kerr Motor Boat Garage, Hamilton, Can.
LeRoy Parrott Kenora, Can.
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Monton y Ruano, Denia, Spain

MOTOR BOATING PRACTICAL HAND-BOOKS

Every motor boatman has long felt the need for a really complete and comprehensive library devoted to their favorite pastime—motor boating. One of the obstacles to the accomplishment of this important work was the difficulty in finding any one writer who could cover the field in its entirety. In presenting the new series of practical hand-books, MoToR BoatinG believes that the problem has been solved at last. These books are edited by Charles F. Chapman, M. E., the editor of MoToR BoatinG, and they are the results of months of untiring effort on his part, together with the best of thousands of suggestions sent to him by motor boatmen themselves. The list of the contents given below will give you some idea of the vast amount of ground covered by these volumes.

Practical Motor Boats and Their Equipment

Volume 1.—The first volume tells you what the ideal boat for various kinds of service should be and what to look for in buying a boat. Many suggestions about decoration and hints on all kinds of equipment. All about steering gears, wireless outfits, electrical attachments, etc. Glance over the list of contents appended herewith: Hulls, Ballast and Seaworthiness; Round Bottom *vs.* Sharp Bilge; What are the Advantages of Flare? Raised Deck *vs.* Trunk Cabin; Best Proportion of Beam to Length; Selecting a New Design; The Advantages of Bilge Keels; Open or Solid Deadwood? What Makes a Hull Seaworthy? The $1,000 Cruiser; Buying a Second-Hand Boat; Types of Bows and Sterns; Exterior Arrangement of Cruisers; The Best Cabin Arrangement; Finishing Up the Cabin; Changes in Interior Arrangement; Interior Arrangement for Open Boat; Propeller-Rudder Arrangements; Best Position for the Rudder; Advantages of the Outboard Rudder; Different Steering Positions; Steering Equipments for Motor Boats; Steering Gear for the Cruiser; The Steering Gear for a Runabout; Steering the Boat from the Side; The Electrical Equipment; Making and Wiring a Switchboard; Electric Lighting on a Motor Boat; The Inexpensive Lighting Outfit; Wiring the Small Cruiser; The Storage Battery; The Dynamo Cut-Out; Wireless for a Small Cruiser; Tender for a Thirty-foot Cruiser; Building a Folding Dinghy; Installing the Boat Boom; What is the Best Galley Arrangement; Ventilating the Galley; The Galley Stove and Its Installation; Making a Fireless Cooker; A Portable Cook Box; Running Water for the Cruiser; How to Build a Portable Table; A Table for the Open Boat.

Practical Motor Boat Building

Volume 2.—As its title implies, this volume takes up the building of your own boat. It also covers the construction of the necessary fittings such as awning, windshield, etc. Every boatman sometime or other builds a boat, and a book of this kind will save much time and prevent many mistakes. List of contents: Types of Motor Boat Fastenings; Boat Building Woods; Laying Down a Boat's Lines; Converting a Trunk-Cabin Cruiser; A Steam Box for Amateur Builders; Joiner Between Stem and Keel; Fastening the Frames and Floors; Boring the Forgotten Limbers; Fitting the Garboard Plank; Boring the Shaftlog; Fitting the Stuffing Box; The Stern Bearings for a Cruiser; A Water-Tight Companionway; How to Canvas a Deck; Hinged Water-Tight Hatches; Making a Water-Tight Hatch; The Coaming of an Open Boat; Fitting a Swinging Port Light; Making a Self-Bailing Cockpit; A Water-Tight Window Sash; Making a Water-Tight Skylight; How to Build an Engine Housing; How to Make an Engine Cover; Building a Tool Locker; Constructing an Extension Transom; How to Make a Pipe Berth; An Ice-Box for a Cruiser; Installing a Toilet; How to Rig a Signal Mast; How to Make a Spray Hood; Fitting a Folding Windshield; An Awning for the Open Boat; A Cover for the Open Cockpit; Screens for the Side Light; A Support for the After Light; A Seat for the Man at the Wheel; Removable Davits for the Cruiser; The Boarding Steps; A Bow Rudder for Your Hydro; The Motor-Driven Club Tender.

Practical Things Motor Boatmen Should Know

Volume 3.—Navigation is one of the important subjects covered in volume three of the series. Tells you how to steer, how to increase the factor of safety, and a host of other things relative to the proper running of your boat. The chart and compass are both fully explained in a clear and comprehensive manner. The list of contents will tell you more about it; Advice for the Beginner; Lessons Learned from Experience; Good Things to Know; Increasing the Factor of Safety; Which Way Should the Boat Steer? Why a Boat Steers Badly; Why do Boats Squat? Figuring the Boat's Speed; Ballasting the Cruiser; Getting Off Bottom; To Ride Out a Storm in a Motor Boat; The Why and How of Storm Oil; Preventing Fire; Handling Ground Tackle; Government Charts; Stowing the Anchor on a Cruiser; Diminishing Deviation; Preventing Electrolysis; Stowing and Using Charts; How to Make a Chart Case; Keeping a Motor Boat's Log; How to Make a Sextant; Tides and Tidal Waters; Taking Her Through the Canals; The Best All Round Dinghy; Towing the Tender; Handling the Dory in a Seaway; Getting the Tender Aboard; Planning for a Cruise; Equipping for a Cruise; Equipment for Offshore Cruising; Novel Events for Regatta Day; Handicapping; The Object of a Handicap Rule; Laying Off a Race Course; Measuring the Length of a Race Course; Preparing a Boat's Bottom for a Race; How to Build a Turning Buoy; Starting Boats in a Race; Stowing the Signal Flags; Fitting a Gun Mount; A Fish Box for Your Cruiser; A Cabin Wall Rack.

Practical Marine Motors

Volume 4.—All about the marine motor; what it should and should not be. Tells why the automobile engine is unsuccessful in marine work. The best location for your engine, the ideal engine bed, the fuel tank, exhaust and countless other suggestions that will enable you to get the best results from your power plant. List of contents: Purchasing a Marine Motor; How Many Cylinders? Power per Cylinder; High Speed *vs.* Heavy Duty; Long Stroke *vs.* Short Stroke; Correct Motor Design; Changes in One's Power Plant; The Things that Cause Vibration; The Automobile Engine for a Boat; The Best Position for the Motor; The Ideal Engine Compartment; Placing the Engine in the Hull; Installing a Motor in a Canoe; Installing Power in a Yawl; Converting a "Banker" to Power Engine Installation in a Hydroplane; Putting Power in the Rowboat; Limits of Shaft Inclination; Constructing the Engine Bed; Getting the Motor Aboard; Lining Up the Propeller Shaft; The Best Exhaust; Mufflers *vs.* Under-Water Exhausts; Installing an Under-Water Exhaust; Primary Batteries for Ignition; Keeping the Ignition System Dry; Installing a High-Tension Magneto; From Make and Break to Jump Spark; Installing the Gasoline Tanks; Taking Care of Extra Gasoline; Spark and Throttle Controls; Constructing a Rear Starter; Propeller for Engine and Hull; Installing a Universal Joint; Gearing Motor to Propeller Shaft; The Automobile Throttle; Harnessing the Main Engine; Rebabbitting a Worn Bearing; Should Fuel Line be Inside or Outside.

Practical Motor Operation and Maintenance

Volume 5.—One of the most valuable books of the entire set. Your motor's ills and how to cure them. This volume tells you how to adjust your carburetor, how to fit piston rings, how to remedy poor compression and a number of other things that will enable you to doctor your own motor. List of contents: Locating the Motor's Troubles; The Overheated Motor; Starting in Cold Weather; Overhauling a Marine Motor; How to Save Fuel; The Fuel Situation; Using Low Grade Fuel; How to Run on Kerosene; Supplying the Fuel to the Carburetor; Adjusting the Carburetor; Cleaning the Fuel Tanks; Cleaning the Gasoline Line; Stopping Up the Leak in the Tank; A Home-Made Gasoline Gauge; Carrying an Extra Supply of Oil; Mixing the Fuel and Lubricant; Remedying Leaky Compression; Killing the Carbon Jinx; Tool and Spare Parts to Carry; Removing and Replacing Piston Rings; Repairing a Leaky Cylinder; Grinding a Motor's Valves; Setting the Valves; Timing the Ignition System; Cleaning the Water Jacket; Making and Fitting a Gasket; Patching Up a Bearing; Straightening the Sprung Shaft; Truing a Bent Propeller; Removing the Flywheel; Separating Couplings and Pipe Fittings; Changing the Shaft Hole Location; Utilizing the Exhaust; Disposing of the Bilge Water; Heating a Small Cruiser's Cabin; Operating the Outboard Motor; The Clean and Quiet Boat; Charging a Storage Battery; When the Motor Stops Unexpectedly; Making a Unit Power Plant.

Practical Suggestions for Handling, Fitting Out and Caring for the Boat

Volume 6.—This volume is an especially valuable one. You will find in it points covering the care of your boat that you never dreamed of before. Whether you are a beginner or a finished expert this book will give you a better knowledge of the handling of your craft than you can imagine. List of contents: Putting the Boat into Commission; Fitting Out a Thirty-Footer; Suggestions for the Beginner; Refinishing Bright Work; Keeping the Wood Surface Bright; Putting the Boat Out of Commission; Laying Up an Unsheltered Boat; Hauling Out for the Winter; Covering the Boat for the Winter; Launching from a Wharf; Correcting Faults; Lengthening Out the Boat; Moorings and Buoys; Taking Steps to Safeguard the Anchor; What to Use in the Bilge; Preserving the Wood in Boats; Emergency Rigs for the Cruiser; Auxiliary Sails for the Cruiser; Providing an Emergency Rudder; Preparing for Southern Waters; Stopping the Troublesome Leak; Replacing a Broken Plank; Removing Broken Lag Screws; Raising the Boat's Stern; Clearing the Propeller; Protecting the Bow and Stern; Open Boat Sleeping Quarters; Ventilating the Cabin of Small Cruisers; Converting the Open Boat to a Cruiser; Making a Cover for the Open Boat; Preventing Electrolysis; Building a Club Float; A Floating Boathouse; Constructing a Landing Stage; Building the Marine; Keeping the Thief Out; A Place for Your Shore Clothes; Stowing for Life Preservers; The Winter's Alterations; What Changes Shall I Make; The Satisfactory Bilge Pump; The Pressure Water System; Making a Pelorus; Your Storm Curtains; Life-Saving Equipment; The Absent Owner's Anchor Light; Mounting the Reverse Gear.

Price $1.25 per volume, or $6 per set of six volumes of over 1,000 pages.

The books measure 7 x 10 inches and are handsomely bound in cloth. Each volume is fully illustrated and printed in clear type on fine paper.

MoToR BoatinG **119 West 40th Street, New York**

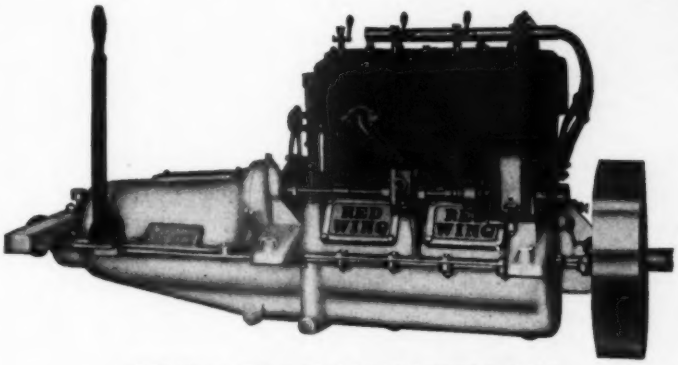
Advertising Index will be found on page 156

Red Wing Thorobred

THE MOTOR WITH POWER TO SPARE

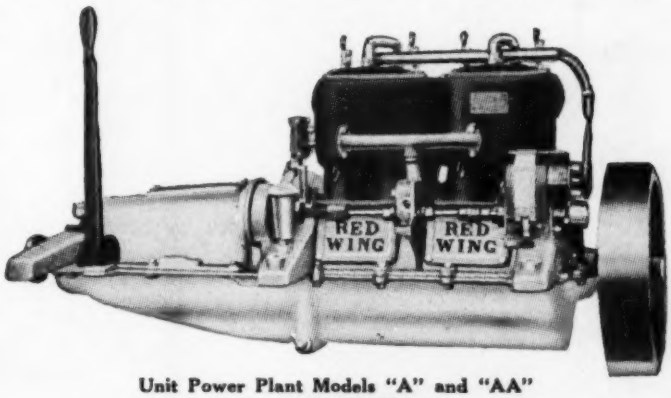
A Ladies' Favorite

Close, smooth running, easily controlled, the Red Wing THOROBRED Marine motor has won wide popularity among the ladies who delight in the operation of a motor boat.



Unit Power Plant Model "F" THOROBRED
28-36 H.P., 4 1/16 x 5"
Furnished with or without Unit Power Plant

Unlike the old days of flying oil and grease, the THOROBRED offers perfect mechanical service with the added advantage of oiling cleanliness. The oil and grease, like the power it gives, is IN the motor.



Unit Power Plant Models "A" and "AA"
THOROBRED
14-20 H.P., 3½ x 4½"—18-24 H.P., 3¾ x 4¾"
Furnished with or without Unit Power Plant

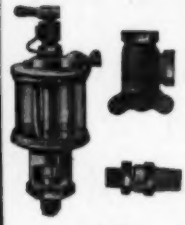
Every channel will be a honey-moon trail if your motor is one of our five sizes of THOROBRED from 10 to 40 H.P. Write us. They burn either kerosene or gasoline.

RED WING MOTOR COMPANY

Dept. B. **Red Wing, Minn., U. S. A.**

Your Motor-

"LUNKENHEIMER Equipped"



is assurance of dependable and satisfactory motor service.

LUNKENHEIMER AUTOMOTIVE ACCESSORIES

have long been recognized as the true standard of excellence for Quality, Efficiency and Economy. Their practical design and high grade materials coupled with the Lunkenheimer method of manufacture peculiarly fits them for marine service. They contribute to economy in operation and insure lasting satisfaction to the user.

Specify LUNKENHEIMER and insist on having the genuine. Your local dealer can furnish them; if not, write us.

Write for Automotive Assessories Catalog No. 4-CC.

THE LUNKENHEIMER CO.
"QUALITY"

Largest Manufacturers of High Grade Engineering Specialties in the World

CINCINNATI

New York Chicago Boston London

29-29-33

Four-Cycle Marine Motors for 1920

(*Continued from page 42*)

80 *to* 145 *Horsepower Four-Cycle Motors*

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M	Wt.	Location of Valves	Ignition
80	Acme	6	7¼x9	425	6,950	H	Opt.
80	Acme	6	6¾x7½	600	4,800	H	Opt.
80	Atlas Imperial	4	.....	320	8,000	H	M. & B.
80	Brennan	4	6 x6	1,000	1,050	L	B. & M.
80	Buffalo	4	6¾x9	800	2,600	L	J. S.
80	Frisco Standard	3	9¾x12	280	9,105	H	Opt.
80	Hicks	3	10 x12½	450	9,200	H	M. & B.
80	Niagara	4	6¼x7	1,000	1,650	T	B. & M.
80	Palmer	6	7½x10	400	5,600	T	B. & M.
80	Ralaco	6	7 x9	425	6,600	H	Opt.
80	Union	3	10 x12	310	9,500	..	M. & B.
80	Winton	6	6½x9	450	...	L	M.
80	Wisconsin	6	5¾x7	800	1,545	T	M.
80	Wolverine	3	11 x12	335	6,747	L	J. S.
85	Acme	4	8¾x10½	325	8,200	H	Opt.
85	Frisco Standard	4	8¾x10½	350	8,920	H	Opt.
85	Sterling	4	5½x6¾	1,200	1,600	T	M.
85	Sterling	6	5½x6¾	800	2,350	T	D. & M.
85	Union	4	9 x11	330	10,140	..	M. & B.
85	Wisconsin	6	5½x7	800	1,585	T	M.
90	Automatic Prod. Gas	3	10½x15	250	...	T	J. S.
90	Doak	6	8 x10	350	9,500	H	M.
90	Wisconsin	6	5¾x7	800	1,615	T	M.
90	Wright Reliable	6	7½x9	350	6,500	H	M.
100	Acme	6	8¼x10	400	8,900	H	Opt.
100	Automatic	4	10 x14	275	11,780	L	Opt.
100	Automatic	4	8½x10	500	6,100	L	J. S.
100	Buffalo	4	10 x12	300	8,200	L	J. S.
100	Cottrell Holmes	4	6 x8¼	1,000	1,500	L	M.
100	Doak	4	9½x11	300	12,000	H	M.
100	Elco	6	5¾x6	1,000	1,000	T	M.
100	Harris	6	8 x10	350	7,300	H	M.
100	Honest Clay	4	8½x10	350	6,500	H	M. J. S.
100	Murray & Tregurtha	6	7½x10	400	6,018	L	Opt.
100	Standard	6	8 x10	400	8,000	L	M. & B.
100	Sterling	4	5½x6¾	1,400	1,275	T	M.
100	Van Blerck	4	5¾x6	1,500	1,500	T	B. & M.
110	Wolverine	3	12½x14	325	10,117	L	J. S.
110	Frisco Standard	3	11¾x15	250	13,800	H	Opt.
110	Union	3	12 x15	280	17,600	..	M. & B.
110	Union	4	10 x12	330	12,350	..	M. & B.
115	Harris	4	10 x14	225	12,850	H	M.
115	Speedway	6	6¾x8½	600	5,000	L	M.
115	Sterling	8	5½x6¾	800	2,700	T	D. & M.
120	Automatic Prod. Gas	4	10½x15	250	...	T	J. S.
120	Frisco Standard	4	9¾x12	320	13,250	H	Opt.
120	Niagara	6	6¼x7	1,000	2,350	T	B. & M.
125	Acme	6	8¾x10½	375	10,800	H	Opt.
125	Hall Scott	4	5 x7	1,700	900	H	J. S.
125	Sterling	6	5½x6¾	1,200	2,050	T	M.
125	Union	6	9 x11	320	14,400	..	M. & B.
125	Winton	6	8 x9	450	...	L	M.
130	Speedway	6	5¾x7	1,000	2,400	L	B. & M.
145	Sterling	6	5½x6¾	1,400	1,650	T	M.

150 *to* 200 *Horsepower Four-Cycle Motors*

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	Location of Valves	Ignition
150	Automatic	6	8½x10	500	9,200	L	J. S.
150	Automatic	6	10½x15	250	...	T	J. S.
150	Buffalo	6	10 12	300	12,800	L	J. S.
150	Cottrell Holmes	6	6 x8¼	1,000	2,600	H	M.
150	Doak	6	9½x11	300	18,000	H	M.
150	Speedway	6	5¾x7	1,200	1,900	L	B. & M.
150	Sterling	4	5½x6¾	1,500	1,525	H	Dual M. Dist.
150	Union	4	12 15	290	22,750	..	M. & B.
150	Van Blerck	6	5¾x6	1,500	1,900	T	B. & M.
150	Winton	6	6½x9	900	...	L	M.
160	Niagara	8	6¼x7	1,000	3,250	T	B. & M.
160	Speedway	6	8½x10	550	5,900	L	M.
160	Wolverine	6	11 12	330	11,765	L	J. S.
170	Sterling	8	5½x6¾	1,200	2,600	T	M.
175	Frisco Standard	4	11¾x15	275	20,220	H	Opt.
175	Harris	6	10 x14	225	16,800	H	M.
175	Speedway	8	5¾x7	1,000	2,900	L	B. & M.
200	Automatic	6	12 x16	200	...	T	J. S.
200	Cottrell Holmes	8	6 x8¼	1,000	3,200	L	M.
200	Doak	4	12¼x15	285	30,000	H	M.
200	Hall Scott	6	5 x7	1,700	1,200	H	J. S.
200	Speedway	8	5¾x7	1,200	2,350	L	B. & M.
200	Sterling	8	5½x6¾	1,400	2,400	T	M.
200	Winton	8	6½x9	900	...	L	M.
200	Winton	6	9½x14	450	...	L	M.
200	Wolverine	6	11 x15	330	16,630	L	J. S.
200	Van Blerck	8	5¾x6	1,500	2,275	T	B. & M.

Four-Cycle Motors Over 220 *Horsepower*

Rated H. P.	Motor	No. of Cyls.	Bore & Stroke	R.P.M.	Wt.	Location of Valves	Ignition
220	Standard	6	10 x11	...	...	L	M. & B.
225	Union	4	14½x18	225	36,400	..	M. & B.
225	Union	6	12 x15	300	30,600	..	M. & B.
225	Sterling	6	5¾x6¾	1,500	2,000	H	Dual M. Dist.
250	Automatic Prod. Gas	6	13½x18	200	...	T	J. S.
250	Speedway	6	11 x12	450	11,400	L	M.
250	Sterling	8	5½x6¾	1,700	1,495	H	M.
250	Union	4	15¼x20	200	49,785	..	M. & B.
275	Frisco Standard	6	11¾x15	300	28,000	H	Opt.
300	Cottrell Holmes	12	6 x8¼	1,000	4,500	L	M.
300	Doak	6	12¼x15	285	43,000	H	M.
300	Standard	6	12 x14	...	...	L	M. & B.
300	Sterling	8	6¾x9	1,000	5,600	T	Dual M.
300	Sterling	8	5¾x6¾	1,500	...	H	Dual M & D ist.
300	Union	4	16 x21	210	55,700	..	M. & B.
325	Union	6	14½x18	225	50,400	..	M. & B.
375	Union	6	15¼x20	200	69,100	..	M. & B.
400	Murray & Tregurtha	6	7¾x9	1,400	3,350	T	Mag
500	Standard Dbl. Act.	6	12½x13	...	...	..	M. & B.

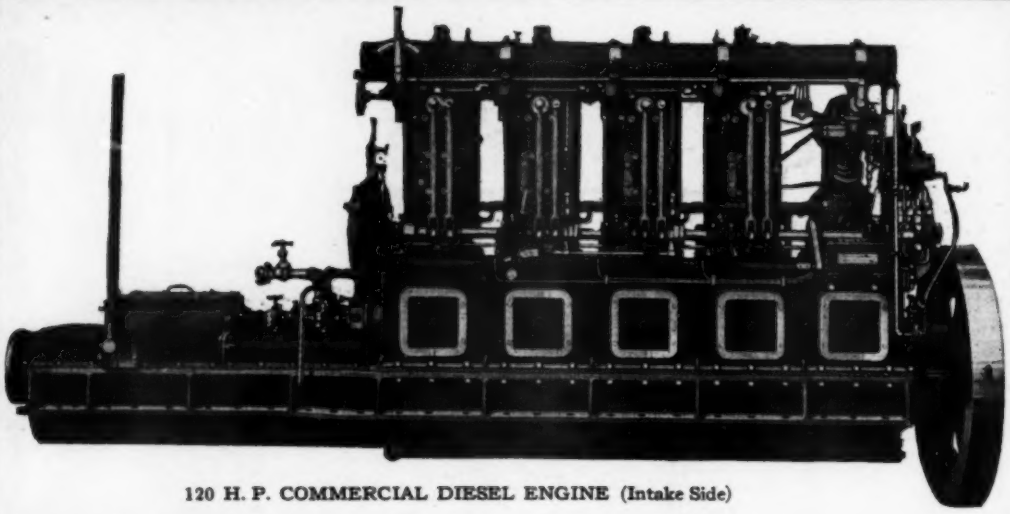
Advertising Index will be found on page 156

NELSECO

HEAVY OIL ENGINES

DIESEL TYPE

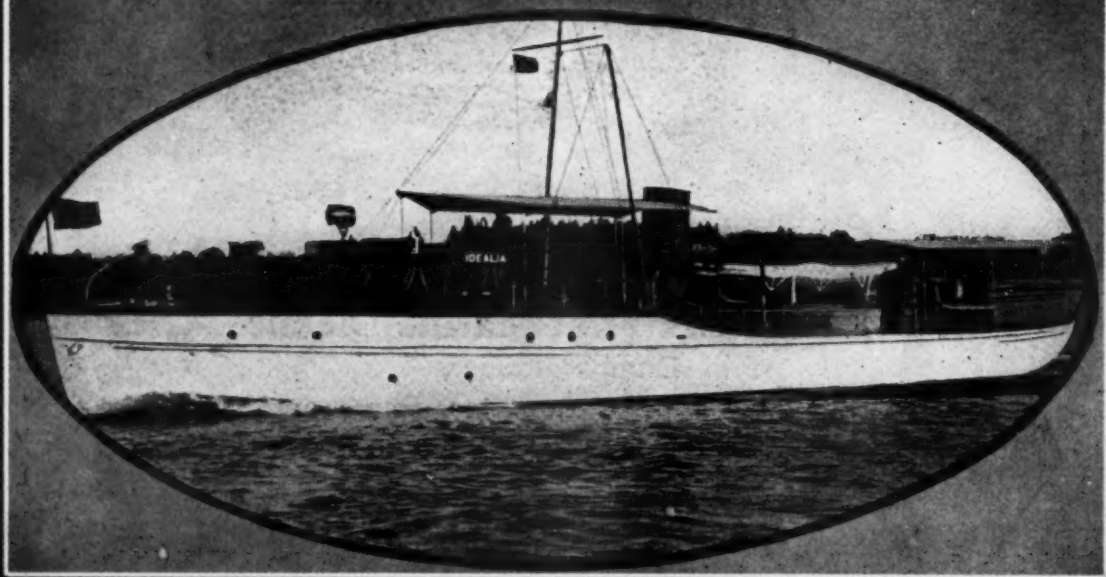
America's First Marine Diesel
Engine Builders
Over 150,000 B.H.P. now in use or on Order
Size 120 B.H.P. and Upwards



120 H. P. COMMERCIAL DIESEL ENGINE (Intake Side)

Yacht "IDEALIA"

"Economical, simple and entirely dependable" is this NELSECO in a yacht. Your new engine will be a duplicate if you want the best engine produced.



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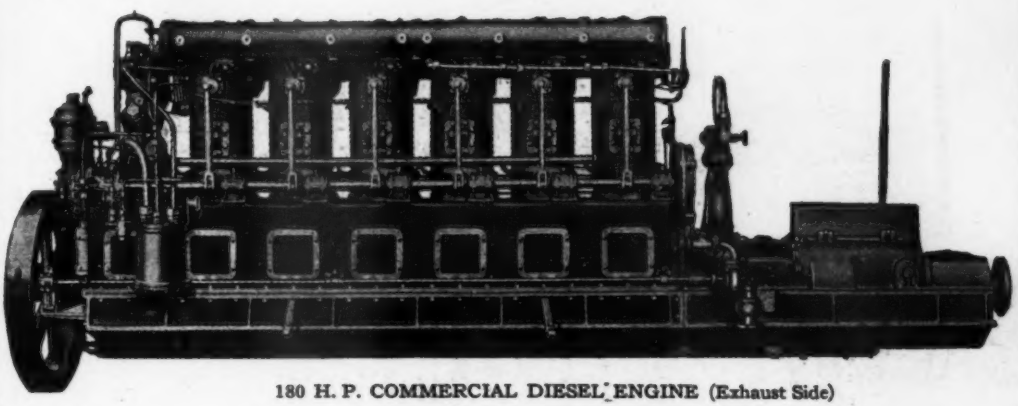
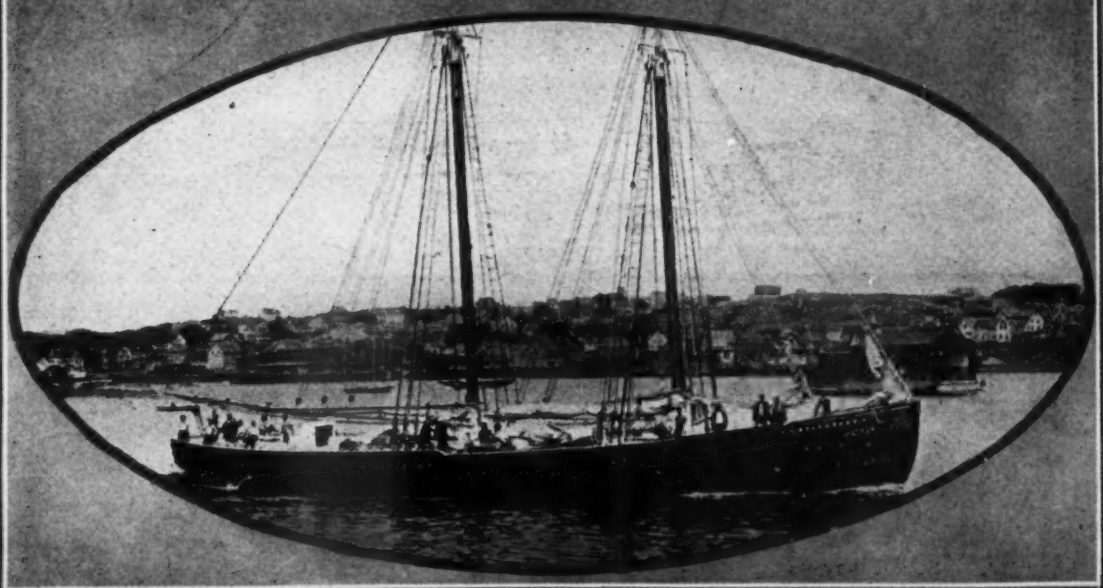
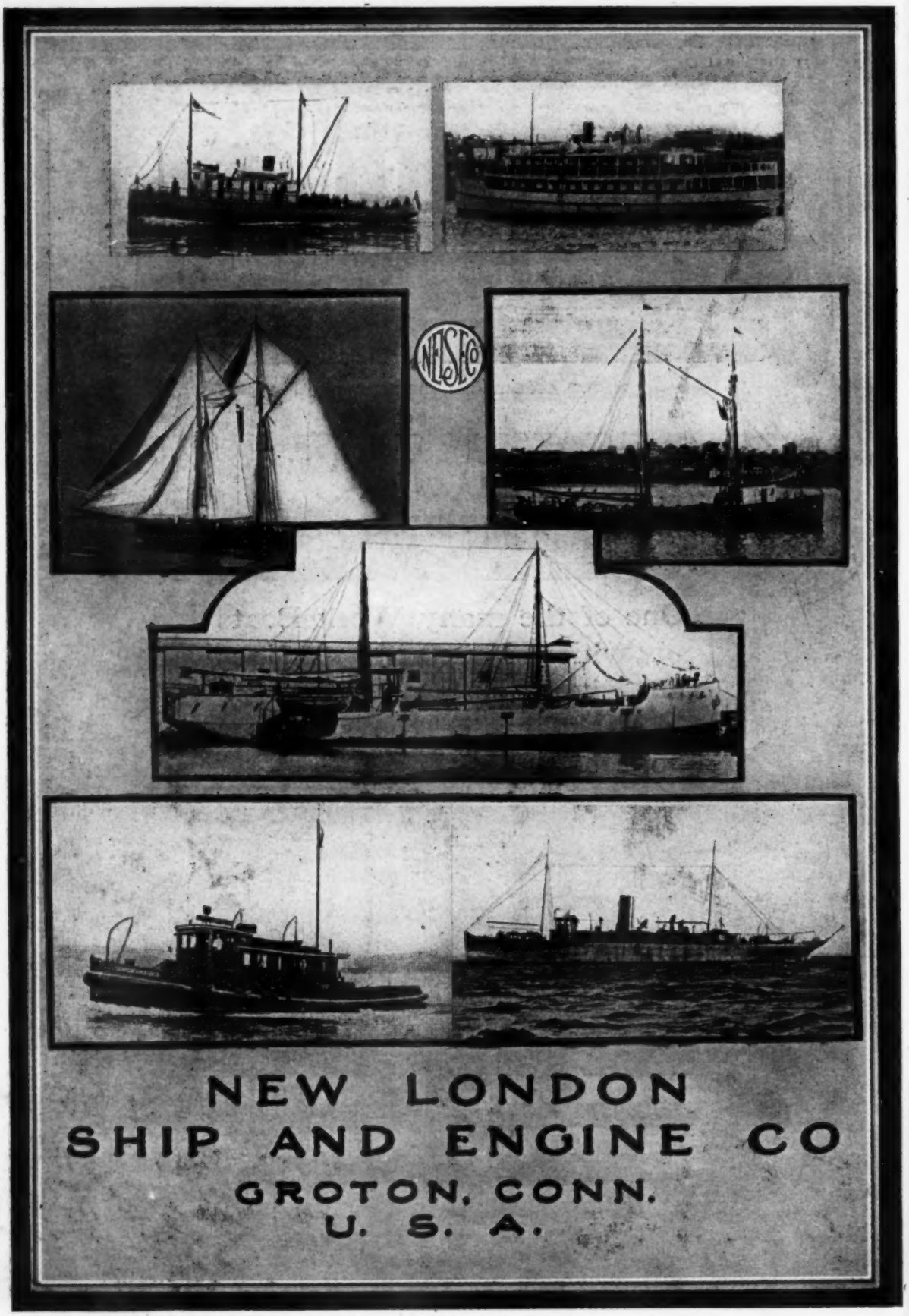


180 H. P. COMMERCIAL DIESEL ENGINE (Exhaust Side)

Fishing Schooner "KILLARNEY"

One of the many Work Boats in which **NELSECO** engines are giving Entire Satisfaction. We'll guarantee the same for your boat.





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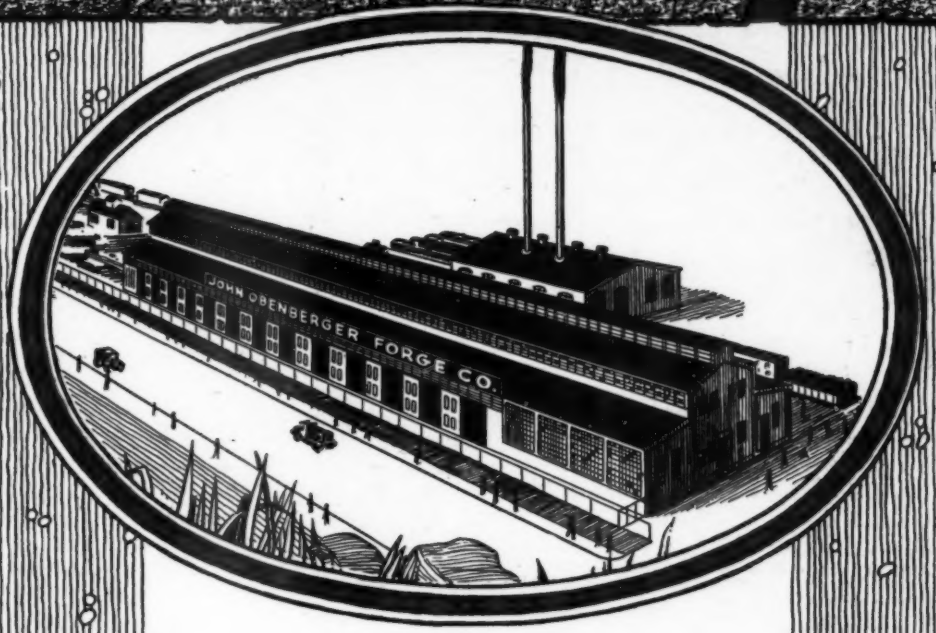
Obenberger



DROP Forgings and Forgings Hammered from Billets are our specialty.

Engine builders will find in our plant equipment and facilities equal to any requirement.

Giving always perfect quality together with Obenberger Service your orders are assured the utmost care and dispatch.

We are awaiting your call.

John Obenberger Forge Company
West Allis - - - Wisconsin

JOHN OBENBERGER FORGE CO. Obenberger Forgings MILWAUKEE WIS PLANT WEST ALLIS

THE MARK THAT STANDS for OBENBERGER SERVICE

JOHN OBENBERGER FORGE CO. Obenberger Forgings MILWAUKEE WIS PLANT WEST ALLIS

THE MARK THAT STANDS for OBENBERGER SERVICE

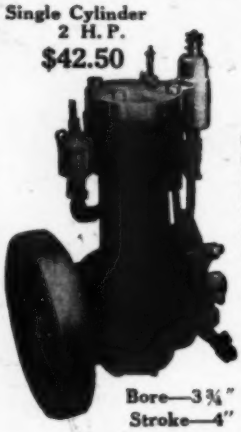
Forgings

DUNN

DUNN FOUR CYCLE MARINE MOTORS

1920 Models—Kerosene or Gasoline Fuel

Single Cylinder
2 H. P.
$42.50



Bore—3¾"
Stroke—4"

Our Prices Speak for Themselves

If you want a reliable economical motor at the lowest possible cost you should own a Dunn Motor. Compare the prices of Dunn Motors quoted on this page with the prices of any other motors in the market. Then write us for full information about the design features of Dunn Motors and how they are built.

Remember all Dunn models are four cycle type, of up-to-date design. Special attention has been given to easy starting and accessibility for easy repair and replacement.

What A Dunn User Writes

"This is to certify that about 10 months ago, I purchased one 12 H.P. Dunn Motor which I had installed in my cabin cruiser, 33½ ft. long by 9 ft. beam, full model boat, and I use this boat in outing trips and have made as high as 200 miles without a stop. It works beautifully, and my little boy, 13 years old, can and does start motor without any trouble. This motor runs smooth and easy, in fact, is as smooth running as any automobile I have ever used. I consider it the best marine engine made." (Signed) Dr. G. H. Howard.

At the prices given, each motor is furnished complete with suitable propeller, shaft, couplings, coil, spark-plugs, mixing-valve and oil-cups.

Customers abroad—Add 10% to prices given to cover cost of boxing thoroughly for export and delivering F. O. B. Steamer New York City.

Write today for our new 1920 catalog

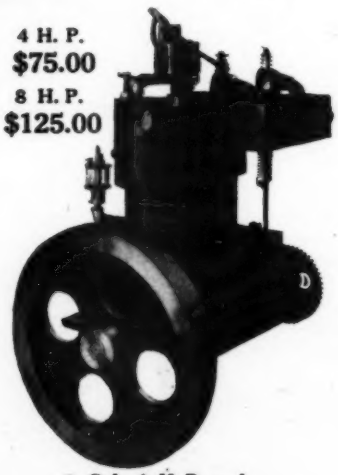
6 H.P. $100.00 12 H.P. $150.00

3 Cyl. 6 H. P. and
3 Cyl. 12 H. P.

6 H. P.
Bore—3¾"
Stroke—4"

12 H. P.
Bore—4¼"
Stroke—5"

4 H. P.
$75.00
8 H. P.
$125.00



2 Cyl. 4 H. P. and
2 Cyl. 8 H. P.
4 H. P. Bore—3¾"—Stroke 4"
8 H. P. Bore—4¼"—Stroke 5"

4-Cyl., 16 H. P.
$175.00

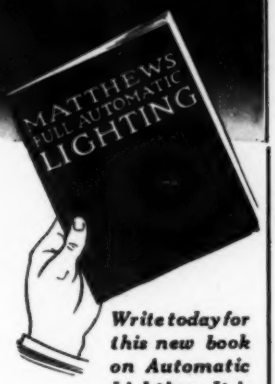
Bore 4¼"
Stroke—5"

Dunn Powered Launch

DUNN MOTOR WORKS, Ogdensburg, New York, U. S. A.

Advertising Index will be found on page 156

MATTHEWS FULL AUTOMATIC LIGHTING



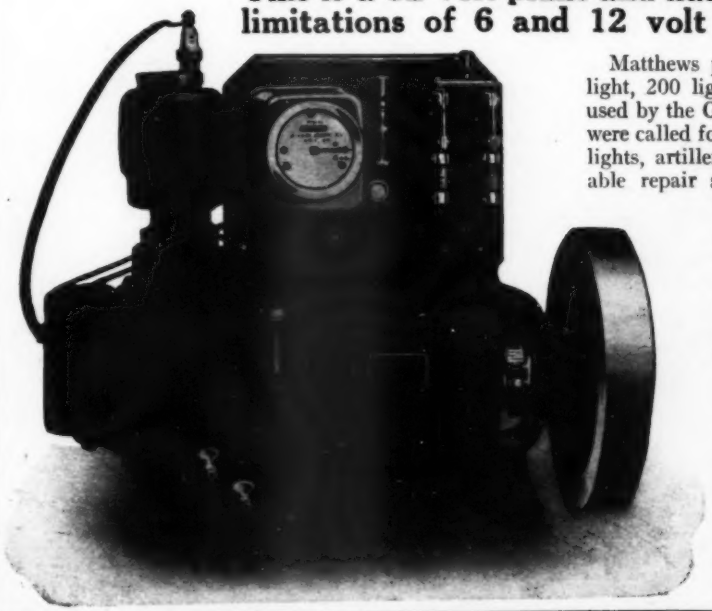
Write today for this new book on Automatic Lighting. It is more than a catalog.

FOR boat houses, cruisers, motor boats, summer cottages, small boat clubs and any other place where electric light and all its advantages are desired.

This is the new Matthews 15 light plant. It is the latest and smallest unit in the Matthews family of Full Automatic Lighting units—and is specially designed for motor boats and boat houses, and summer home use.

Weight 148 pounds, length overall 22½", height overall 18¼", width 10". Runs free from vibration. Supplies 15 lights from generator only and more when battery is drawn on at same time. **This plant will operate the largest searchlight suitable for a boat up to 90 feet in length.**

This is a 32 volt plant and has not the limitations of 6 and 12 volt service.

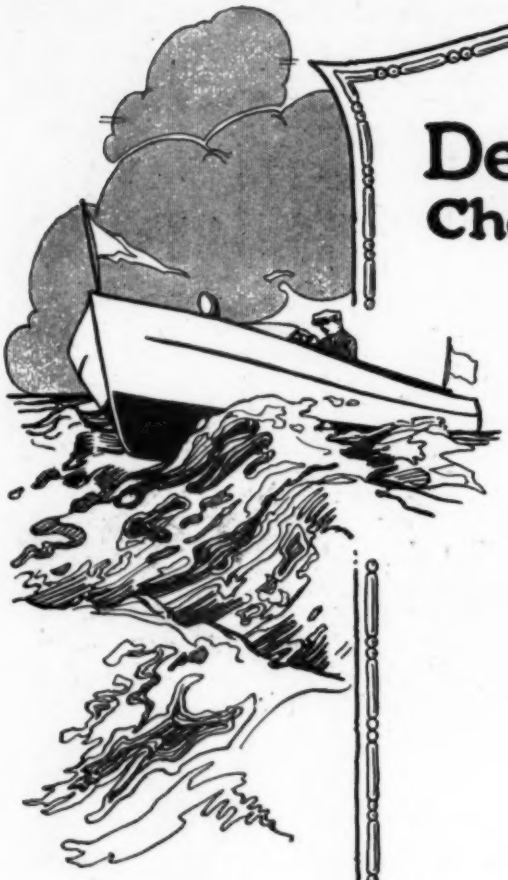


Matthews plants are made in 15 light, 50 light, 100 light, 200 light, and 500 and 1000 light sizes and were used by the Government wherever electric light and power were called for, in France, in Y. M. C. A. huts, for searchlights, artillery control and for power and light on portable repair shops. Besides, Matthews Full Automatic Lighting Systems were used for auxiliary light and wireless power on all new U. S. transports built by the Shipping Board.

Matthews lighting plants are Full Automatic—start themselves when the load is too great for the battery—start themselves when the battery is partially discharged—and add years to the life of the battery by their automatic features. It will be interesting to you to read the new Matthews book on lighting.

Write for the catalog today.

Matthews Engineering Co.
425 Monroe Street
Sandusky, Ohio



Dependable Power-
Cheaper Running Costs

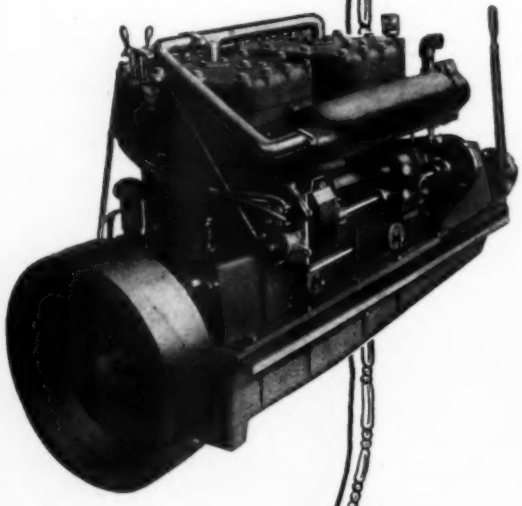
You can safely use kerosene if your boat has a Doman engine because the Doman has the famous Holley-Doman Carburetion System.

This is entirely different from a "hot spot" or jacketed manifold. It secures perfect combustion — gets all the power from low priced kerosene. No excessive carbon or smoke, no oil troubles.

Durability is insured through careful construction throughout—oversize waterjackets, great bronze-backed bearings, giant valves and leakproof oiling system.

Get the facts about the remarkable Doman engine before you re-engine your old boat or buy a new one.

Specifications on Request.



The H. C. Doman Co.
Station 805 Oshkosh, Wisconsin

DOMAN
·OSHKOSH, WIS·

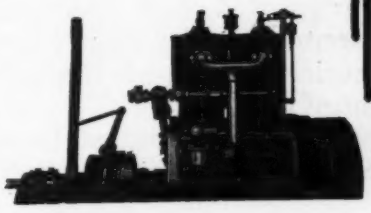
MASTEN

Pleasure Boats, Work Boats, Trawlers, Marine Motors, Accessories and Supplies

Let us quote prices on the kind of a boat you want, no matter what the size or type, or on the power plant, marine accessories or supplies you need. Our sales and display rooms at

Booth 4, Concourse, Hudson Terminal Building, 50 Church Street, New York City

are maintained especially for the convenience of our downtown customers, and for export houses seeking immediate information on marine products for which they have inquiries.



Agents for Vulcan, Niagara and Caille Engines, Also Wisconsin Outboard Motors

We can supply you a suitable power plant for any type of boat requiring from 2 H.P. up to the heaviest engine. We are also manufacturers of Life Preservers, Boat Upholstery, and Draperies, Life Rafts, Life Preserver Cushions, Universal Safety Suits, Liberty Swimming Belts, etc.

Masten's Life Preservers are adjustable and reversible, and meet the latest rulings of the Government. The large buoyant collar will keep the wearer's head well above water under all conditions. These Life Preservers can be worn as reefers in cold and inclement weather.

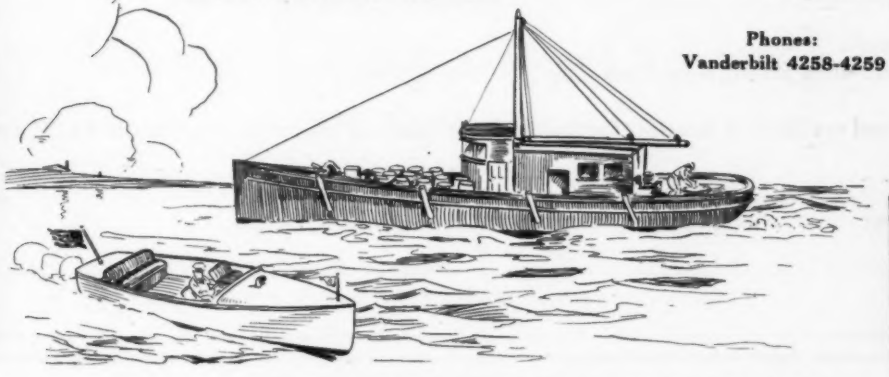
Write or Phone for Information or Catalogs on Masten Products

G. H. Masten Company, Inc.

Address Mail Inquiries to Office and Plant

222-224-226 East 46th Street **New York City**

Phones:
Vanderbilt 4258-4259



Boat Owners, Prospective Owners, Builders, Ship Chandlers, Hardware and Marine Dealers.

Nineteen twenty is going to be the greatest motor boating year ever known. Plans are under way for a most active season. Every boat will be in commission and thousands of new ones will be built.

MoToR BoatinG in 1920 is going to be better than ever. The country's most prominent writers on boating and allied subjects will contribute articles you cannot afford to miss.

William H. Hand, Jr., one of the world's most successful motor boat designers, originator of the famous V-bottom type, will design for MoToR BoatinG exclusively twelve complete motor boats, one of which will appear in each issue for 1920.

Every issue of MoToR BoatinG will be brim full of interesting articles from cover to cover. All information about the first International Motor Boat Race, the most important event in the motor boating racing world, is going to be fully reported. MoToR BoatinG will also feature the first race for the $5000 trophy presented by Carl G. Fisher for the displacement boat championship of North America. Also, all the other races held will be given the attention of MoToR BoatinG.

The Prize Contest Department which has made MoToR BoatinG famous the world over, will be continued with even greater interest in 1920.

Besides—there are to be scores of cruising stories, plans, pictures and descriptions of new boats, motor boatmen's charts—My Ideal Houseboat series, and the hundreds of other editorial subjects dear to the boatman, all in MoToR BoatinG during 1920.

There's only one way of making sure of all the news and doings—

Subscribe for MoToR BoatinG Today

MoToR BoatinG is sold for 25 cents a copy on all newsstands (or the 12 issues for $3.00). Send us the coupon below and we will mail you MoToR BoatinG for a whole year for $2.00. You save a dollar and all the bother.

Send No Money — Just Mail the Coupon

MoToR BoatinG,
119 West 40th Street, New York City
Gentlemen:

Please mail me MoToR BoatinG for one year and send me bill for $2.00 (Canada $2.50, foreign $3.00).

Name _____

Street Address _____

City _____ **State** _____

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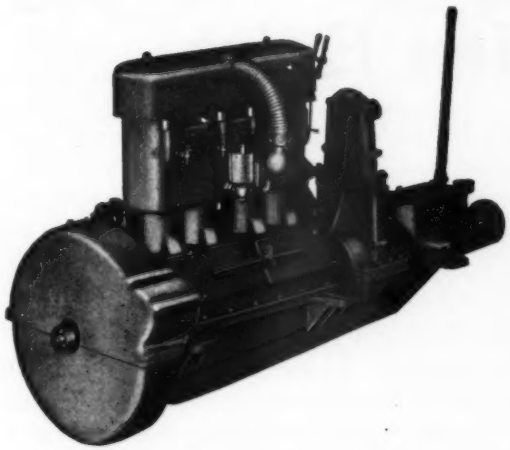
NEW GRAY MOTORS

3½ x 5 MODEL VM—10 to 25 H. P.



This new model "VM" Gray 4 cycle motor marks an epoch in Marine Motor history. In this motor is embodied the results of the most modern gasoline motor practice and backed by an old established motor building organization and its experience. *Note* carefully the *features* that give this engine character. First, let us examine carefully into the

Crank Shaft

A good crank shaft is the beginning of a good motor. If your crank shaft is small and badly designed there is no use of trying to build a good motor around it. Compare the "VM" crank shaft diameter and length of bearings with every other motor of similar bore and stroke on the market. Next, in fact equally as important is

Bearings

The bearings on the "VM" are not only large interchangeable and made of the best material obtainable, but are BRONZE BACKED, the same type of bearing as used in the famous Liberty Aeroplane Motor, and have nearly 50% more bearing surface than the average of the V. M. S. competitors

It took a lot of nerve to lay aside so good a motor as our former model "D" and substitute a new one, but we feel that we must keep one motor up to date and give our customers the best there is. So analyze our

Lubricating System

The force feed to all main bearings and to troughs for lubricating the connecting rod bearings by splash with a pressure indicator to tell you at all times if your pump is working properly.

Overhead Valves

This is the day of overhead valve motors. All the aeroplane motors —also the Reo, Marmon, Chevrolet, Buick, Nash and a host of others have adopted the overhead valve—it is more efficient, more powerful and more accessible.

Back-fireing

This motor cannot backfire and set fire to your boat.

Kerosene or Gasoline

All gasoline now is poor stuff, the motor designed five or six years ago uses it, but not satisfactorily, it takes a different design of intake to properly use this low grade fuel. Our HOT SPOT cylinder head uses not only gasoline of the poorer grades but even kerosene and gives absolute control, flexibility and a clean motor.

Fly Wheel Enclosed

if you want it so, or not —as you choose.

Power

Our overhead valve, special timing system, Hot Spot manifold and excellent workmanship and design produce a power result that is most remarkable. Study our power curve.

Standard Electric Starters

fit the job without cutting or fitting.

A New Model $4\frac{3}{4}$ x 6

This new 4 cylinder, Valve-in-head 35-45 H. P. motor now ready for delivery. Write today for literature.

Gray Motor Company, Detroit, Mich.

2106 Mack Avenue

GRAY 2-CYCLE MOTORS

Ask for New Catalogue of Gray 2-cycle Motors 3 to 8 H. P.
STANDARD the World over.

THE JOHNSON MARINE REVERSE GEAR

Wherever Good Boating Facilities Exist

Johnson gears are on the job—making the sport of boating more enjoyable—the work of boating more efficient. Good boatmen everywhere have applied the test of actual experience, and have endorsed the Johnson as the one gear that is thoroughly reliable. The highest satisfaction in boating for business or pleasure is realized through Johnson equipment.

Johnson service extends to every corner of the earth. There is no place too remote and no order too small to deserve our prompt and careful attention. Johnson Gears go everywhere; they make a permanent place for themselves and never have to come back. If dependable service means anything to you, see that your equipment this year includes a

JOHNSON Marine Reverse GEAR

Foreign Representatives;

CANADA: Williams & Wilson, Ltd., Montreal, Quebec. ENGLAND: The Efandem Co., Ltd., 22 Newman St., Oxford St., London W.I. AUSTRALIA: Edwin Wood Pty., Ltd., 231 Elizabeth St., Melbourne. DENMARK and SWEDEN: Wilh. Sonesson & Co., Malmo & Copenhagen. JAPAN: Andrews & George Co., 16, Takegawa-cho, Kiobashi-ku, Toyko. FRANCE: Anciens Etab. Glaenzer & Perreaud, 18 Faubourg du Temple, Paris. NORWAY: Oscar C. M. Knudson, Odinsgate 4, Christiania. SWITZERLAND: C. Jules Megevet, 7 Rue de Malatrex, Geneva.

Made in Five Practical Sizes for Light and Medium Powered Boats

Gear No.	H. P. per 100 R.P.M. Max.	H. P. for High Speed Motors Max.	Weight		List Price	List Price	Min. Length Overall	Width Overall	Depth from Shaft Center	Height from Shaft Center	Shaft Diameter
			Cast Iron Case	Aluminum Case	Cast Iron Case	Aluminum Case					
0	½	5	23	19	$48.00	$72.00	11 7/16	7¾	2¼	3 1/16	5/8
1	1	10	40	32	72.00	96.00	13 7/8	9 7/8	2 13/16	4 1/8	7/8
1A	1½	15	70	5	84.00	108.00	16 1/16	10 1/8	3 3/16	4 7/16	1
2	3	30	93	75	96.00	120.00	18 1/8	11 3/8	3 11/16	5 1/8	1 1/8
3	5	50	248	211	144.00	180.00	24 5/16	16¼	5 1/8	7 1/8	1½

Write Department 25 for full information

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

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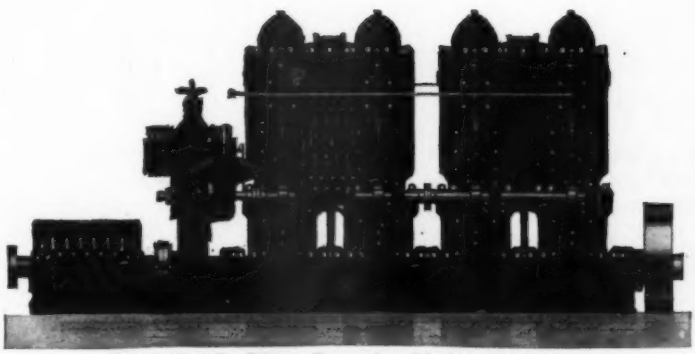
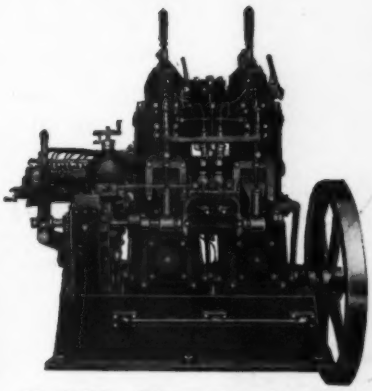
GULOWSEN GREI

HEAVY OIL ENGINES

Factory, Seattle, U. S. A.



240 B.H.P. Direct Reversing Marine Engine



45 B.H.P. Direct Reversing Stationary Engine

GG Engines are built in sizes from 4 B.H.P. to 550 B.H.P., Marine and Stationary, operating on fuel oil having a gravity of not less than 24 degrees Baume.

The efficiency of a heavy oil engine is measured by the fuel consumption per brake horse power hour. The fuel consumption of a GG Engine is a little over one-half pound Russian Fuel Oil per brake horse power hour.

GG Engines are operating efficiently in every part of the world, due to the fact that they are the result of seventeen years' experience in successfully manufacturing heavy oil engines.

For further Information Address Dept. K

GULOWSEN SALES CORPORATION

SEATTLE - NEW YORK - CHRISTIANIA

Consolidated

The New "Lyndonia"

Another example of our superiority in construction and design.

The new "Lyndonia" will be the largest and most completely equipped yacht to be delivered in 1920.

Built of steel—steam powered with oil burners.

CONSOLIDATED
SHIPBUILDING CORPORATION
MORRIS HEIGHTS, NEW YORK CITY

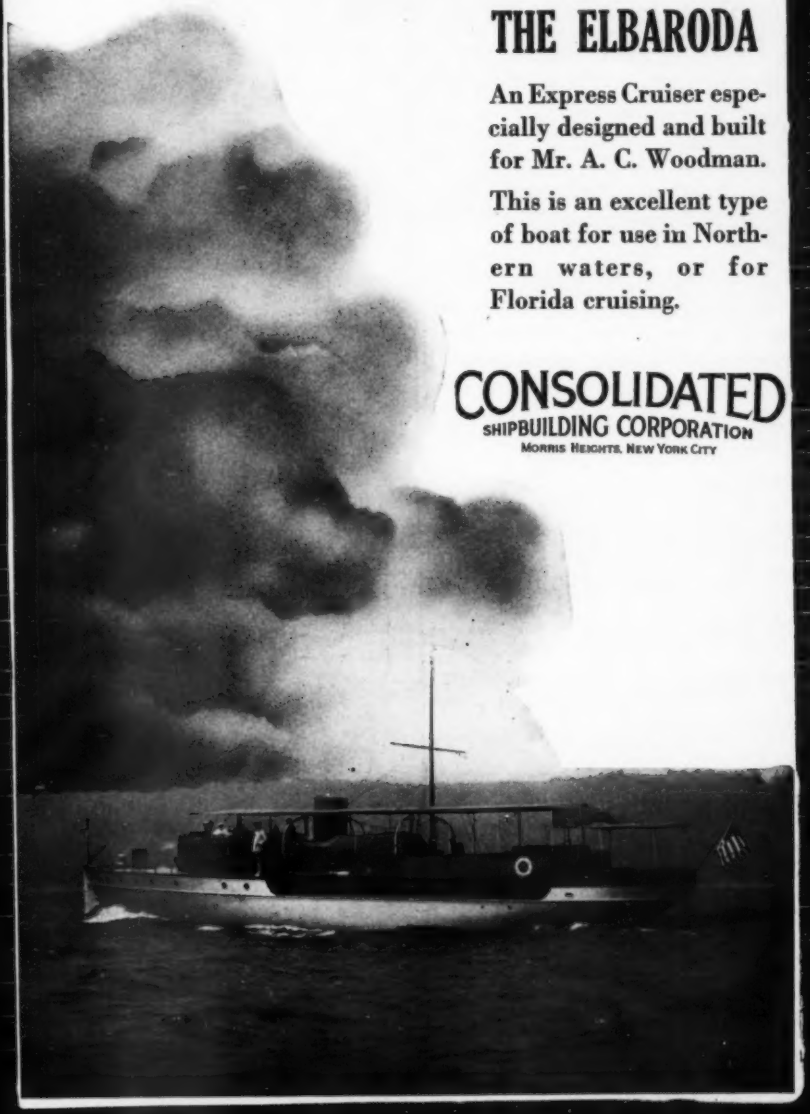
Advertising Index will be found on page 156

Shipbuilding Corp.

THE ELBARODA

An Express Cruiser especially designed and built for Mr. A. C. Woodman.

This is an excellent type of boat for use in Northern waters, or for Florida cruising.



CONSOLIDATED
SHIPBUILDING CORPORATION
MORRIS HEIGHTS, NEW YORK CITY

Coming in 1920

Greatest Series of Motor Boat Plans Ever Published

WILLIAM H. HAND, Jr., the world's most famous designer of V-Bottom Motor Boats, will design twelve complete motor boats for MoToR BoatinG next year.

A complete set of working plans of one of Mr. Hand's designs will be published in each issue of MoToR BoatinG in 1920 beginning with the January number.

Plans published will be to scale and will include lines, offsets, outboard profile, general arrangement and general construction plans together with building specifications. Everything complete ready to build from.

The sizes and types of boats of which full plans will appear are as follows:

15-Foot Runabout
18-Foot Runabout
21-Foot Runabout
25-Foot Runabout
25-Foot Cruiser
28-Foot Runabout
28-Foot Cruiser
30-Foot Cruiser
35-Foot Auxiliary Sloop
36-Foot Cruiser
40-Foot Cruiser
45-Foot Auxiliary Schooner

Be sure to get every copy by being a subscriber. Back issues will not be available. Send in your subscription today.

Two dollars per year or twenty-five cents per single copy. If you prefer; send us your order without money and we will send bill later.

MoToR BoatinG
119 West 40th Street
NEW YORK

MoToR BoatinG,
119 West 40th Street, New York City.

Gentlemen:

Please mail me MoToR BoatinG for one year and send me bill for $2.00 (Canada $2.50, foreign $3.00).

Name.....

Street Address.....

City..... State.....

Exports of Gasoline Marine Engines

(*Continued from page 16*)

	Fiscal Year 1918 Number	Fiscal Year 1918 Value	Fiscal Year 1919 Number	Fiscal Year 1919 Value
Europe:				
Austria-Hungary	....	.....	....	.....
Azores and Madeira Is.	2	$896	7	$681
Belgium	....	.....	15	1,110
Bulgaria	....	.....	....	.....
Denmark	90	12,768	58	21,534
Finland	....	.....	62	25,820
France	155	170,560	98	274,291
Germany	....	.....	....	.....
Gibraltar	....	.....	1	409
Greece	....	.....	75	70,202
Iceland and Faroe Is.	10	1,026	15	1,389
Italy	358	464,498	273	620,395
Malta, Gozo, etc.	....	.....	....	.....
Netherlands	....	.....	88	20,356
Norway	317	58,128	684	149,685
Portugal	25	15,032	14	7,884
Roumania	....	.....	....	.....
Russia in Europe	12	13,245	....	.....
Serbia, Montenegro, etc.	....	.....	....	.....
Spain	94	43,707	146	168,305
Sweden	49	10,715	193	49,920
Switzerland	7	708	8	7,420
Turkey in Europe	....	.....	....	.....
United Kingdom—				
England	341	174,988	553	106,551
Scotland	....	.....	....	.....
Ireland	....	.....	66	7,942
North America:				
Bermuda	8	685	6	2,060
British Honduras	14	2,272	24	9,236
Canada	2,553	809,973	1,463	608,677
Central American States—				
Costa Rica	1	231	4	432
Guatemala	6	449	10	2,765
Honduras	2	1,206	4	1,518
Nicaragua	16	9,237	14	11,665
Panama	18	13,058	8	2,405
Salvador	....	.....	1	85
Mexico	79	40,109	125	114,773
Miquelon, Langley, etc.	70	7,305	125	15,297
Newfoundland and Labrador	735	80,811	1,388	228,416
West Indies—				
British—				
Barbados	3	637	1	886
Jamaica	5	2,747	....	.....
Trinidad and Tobago	20	2,400	9	13,083
Other British	7	1,227	22	13,614
Cuba	421	75,143	191	62,925
Danish (Virgin Islands)	3	395	5	2,500
Dominican Republic	11	4,008	9	3,156
Dutch	3	1,511	....	.....
French	15	1,528	6	1,047
Haiti	11	1,008	2	303
South America:				
Argentina	196	30,004	126	96,871
Bolivia	....	.....	1	6,668
Brazil	105	19,259	123	61,070
Chile	83	28,091	69	286,511
Colombia	5	759	9	3,387
Ecuador	11	15,026	5	2,764
Guiana—				
British	30	7,635	17	3,230
Dutch	1	572	2	214
French	....	.....	....	.....
Paraguay	....	.....	....	.....
Peru	60	45,003	60	109,446
Uruguay	8	1,128	17	6,292
Venezuela	3	3,989	29	3,843
Asia:				
Aden	1	148	....	.....
China	44	36,107	142	113,629
China, leased territory—				
French	2	180	....	.....
Japanese	....	.....	....	.....
East Indies—				
British—				
British India	259	130,745	117	91,421
Straits Settlements	118	22,220	119	29,427
Other British	....	.....	6	4,955
Dutch	106	24,819	159	82,160
French	....	.....	13	2,588
Hongkong	11	25,691	72	54,983
Japan	154	33,243	419	105,976
Persia	....	.....	2	2,987
Russia in Asia	....	.....	7	4,586
Siam	45	10,655	111	82,852
Turkey in Asia	....	.....	....	.....
Oceania:				
British—				
Australia	313	55,674	649	100,198
New Zealand	30	15,777	43	11,047
Other British	29	5,437	21	9,189
French	24	9,875	15	16,163
German	11	14,788	5	7,950
Philippine Islands	73	40,075	383	160,524
Africa:				
British Africa—				
West	4	583	15	2,064
South	13	2,079	51	17,089
East	....	.....	4	1,896

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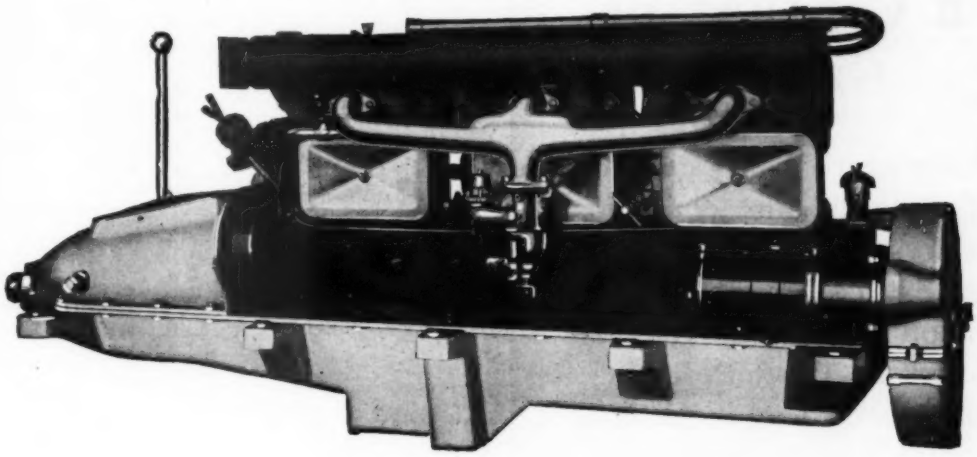
Scripps

"The Motor That Crossed the Atlantic"



SCRIPPS engines have always been good engines. Scripps motors will always deliver the greatest measure of real motor enjoyment, satisfaction and service. Pedigree counts. They are strong, practical, enduring, safe and certain above all things yet satisfy every modern requirement in appearance, comfort, quietness and smoothness of operation.

Made in two, four and six cylinders 10 to 75 H.P. —gasoline, distillate or kerosene.

SCRIPPS MOTOR COMPANY

631 LINCOLN AVE. DETROIT, MICH.

"Every Moving Part Enclosed"

ASTORIA MAHOGANY

Nearly Half a Century of Growth

After nearly half a century of growth, this company represents probably the largest complete organization in the country devoted to the production, manufacture and distribution of

Mahogany Lumber and Veneers

Growth is the natural result of service, and now that we have co-ordinated all branches of the industry under one organization we are in a position to offer even more complete service than in the past.

Astoria Mahogany Co., Inc.
347 Madison Avenue, New York

Successors to
Huddleston-Marsh Mahogany Co.
Astoria Veneer Mills and Dock Co.
Mills and Yards, Long Island City, New York

BRANCHES:
44 North Market Avenue, Grand Rapids, Mich.
2256 Lumber Street, Chicago, Ill.

Exports of Gasoline Marine Engines

(*Continued from page 150*)

Canary Islands	....	.....	2	7,300
Egypt	....	.....	3	227
French Africa	4	435	17	1,892
German Africa	....	.....	....	.....
Italian Africa	....	.....	....	.....
Liberia	1	190	....	.....
Madagascar	....	.....	1	100
Morocco	....	.....	2	5,200
Portuguese Africa	2	706	11	4,282
Spanish Africa	....	.....	....	.....
	7,225	$2,603,104	8,617	$4,130,308

Exports of Motor Boats

	Fiscal Year 1918 Number	Value	Fiscal Year 1919 Number	Value
Europe:				
Austria-Hungary	....	.....	....	.....
Azores and Madeira Is.	....	.....	....	.....
Denmark	....	.....	....	.....
France	2	$2,400	....	.....
Germany	....	.....	....	.....
Gibraltar	....	.....	....	.....
Iceland and Faroe Is.	....	.....	1	$400
Italy	72	2,080,800	50	2,000,000
Netherlands	....	.....	....	.....
Norway	1	3,000	2	3,349
Portugal	....	.....	....	.....
Russia in Europe	10	117,500	....	.....
Spain	1	999	....	.....
Sweden	....	.....	....	.....
Turkey in Europe	....	.....	....	.....
United Kingdom—				
England	1	1,200	....	.....
Scotland	....	.....	....	.....
North America:				
Bermuda	....	.....	1	300
British Honduras	....	.....	....	.....
Canada	22	27,296	32	36,315
Central American States:				
Costa Rica	....	.....	....	.....
Gautemala	....	.....	....	.....
Honduras	....	.....	3	3,100
Nicaragua	3	3,750	3	9,460
Panama	6	5,538	3	14,655
Salvador	1	4,750	....	.....
Mexico	36	111,630	17	32,631
Newfoundland and Labrador	....	.....	....	.....
West Indies—				
British—				
Barbados	1	1,500	....	.....
Jamaica	....	.....	1	2,400
Trinidad and Tobago	....	.....	....	.....
Other British	2	1,650	....	.....
Cuba	7	5,301	6	17,485
Dominican Republic	3	2,210	....	.....
Dutch	....	.....	....	.....
French	1	462	....	.....
Haiti	....	.....	....	.....
South America:				
Argentina	2	2,496	....	.....
Bolivia	....	.....	1	2,500
Brazil	4	4,575	....	.....
Chile	8	18,788	4	9,535
Colombia	3	19,933	4	6,110
Ecuador	1	335	1	69
Guiana—				
British	1	6,000	1	1,200
Dutch	2	3,000	2	21,000
Paraguay	....	.....	....	.....
Peru	6	11,531	2	5,500
Uruguay	1	585	....	.....
Venezuela	4	4,060	....	.....
Asia:				
Aden	....	.....	....	.....
China	2	1,089	....	.....
China, leased territory—				
French	....	.....	....	.....
East Indies—				
British—				
British India	3	2,025	....	.....
Straits Settlements	....	.....	1	553
Dutch	3	804	....	.....
Hongkong	....	.....	....	.....
Japan	1	287	8	8,864
Russia in Asia	....	.....	....	.....
Siam	....	.....	1	900
Turkey in Asia	....	.....	....	.....
Oceania:				
British—				
Australia	....	.....	....	.....
New Zealand	....	.....	....	.....
Other British	3	6,407	....	.....
French	1	.....	1	150
Philippine Islands	....	.....	1	2,050
Africa:				
Belgian Kongo	....	.....	1	115,000
British Africa—				
West	....	.....	....	.....
South	....	.....	....	.....
East	2	827	....	.....
Canary Islands	....	.....	....	.....
Egypt	....	.....	....	.....
French Africa	....	.....	1	4,500
Liberia	....	.....	....	.....
Portuguese Africa	2	6,855	....	.....
	218	$2,460,581	151	$2,301,454

(*Continued on page 154*)

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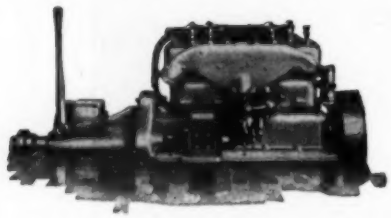
Big and little producers and consumers of gasolene are Standard Engine owners.

One of the biggest private owners, in number of Standard Engined boats, is the Standard Oil Company with its subsidiaries.

Back of the Standard Guarantee is the
STANDARD MOTOR CONSTRUCTION CO.
178 Whiton Street Jersey City, New Jersey

CAILLE

Aristocrat



Controlled Like an Automobile Motor

With a Caille Aristocrat in your boat you can forget your motor entirely. You need never worry as to whether your motor will start promptly or remain running. It is built and controlled like an automobile motor. You have all the instruments right in front of you, mounted on the bulkhead. Starting, stopping, speed variation—all is accomplished instantly by manipulation of controlling devices at your fingers' tips.

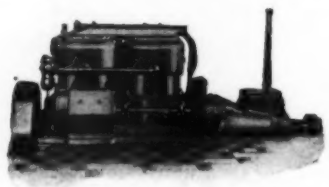
You never have to crank the Aristocrat. It starts with pressing a button. For it has an electric starter like those on automobiles. It even furnishes electric lights for the boat. Has four cylinders and is of the four cycle type.

And it's the neatest, most gracefully designed motor you ever saw. Everything is fully enclosed. Nothing to catch clothing. No place where oil can splash out. It's truly the highest development ever attained in a marine motor, for the average pleasure or speed boat.

Get the details. Use the coupon. Send for catalog and prices.

CAILLE PERFECTION MOTOR CO.

412 Caille Building **DETROIT, MICHIGAN**



USE THIS COUPON

CAILLE PERFECTION MOTOR CO.,
412 Caille Bldg., Detroit, Mich.

Gentlemen:

Tell me whether the Aristocrat is suited to my hull. Dimensions follow:

Length .....Beam .....

Draft .....Model .....

Speed desired.....m.p.h.

If the Aristocrat is not just suited to my hull—what engine do you recommend?

Name .....

Address .....

.....

Exports of Steam Marine Engines and Parts

(*Continued from page* 152)

	Fiscal Year 1918		Fiscal Year 1919	
	Number	Value	Number	Value
Europe:				
France	3	$12,723	1	$6,800
Italy	39	14,650	....	.....
Norway	18	7,307	7	3,014
Russia in Europe	4	875	....	.....
Spain	7	15,991	15	14,413
United Kingdom—				
England	13	3,554	....	.....
Ireland	....	.....	....	.....
Scotland	....	.....	4	4,744
North America:				
British Honduras	1	434	1	166
Bermuda	....	.....	1	250
Canada	102	675,918	85	839,258
Central American States—				
Guatemala	....	.....	....	.....
Honduras	2	244	....	.....
Nicaragua	....	.....	2	3,043
Panama	1	673	4	2,500
Mexico	1	5,198	6	8,568
Newfoundland and Labrador	2	1,488	27	4,396
West Indies—				
British—				
Jamaica	....	.....	....	.....
Trinidad and Tobago	1	346	....	.....
Other British	....	.....	....	.....
Cuba	6	5,411	9	7,507
Dominican Republic	....	.....	....	.....
Haiti	1	681	....	.....
South America:				
Argentina	3	1,712	5	47,150
Brazil	....	.....	3	4,393
Chile	66	83,324	2	1,605
Colombia	1	2,200	2	1,475
Guiana—				
British	1	2,042	4	2,200
Peru	....	.....	2	15,082
Uruguay	....	.....	1	988
Venezuela	2	688	....	.....
Asia:				
China	....	.....	31	70,998
China, leased territory—				
Japanese	....	.....	....	.....
East Indies—				
British—				
British India	38	37,511	1	931
Straits Settlements	....	.....	4	118,000
Dutch East Indies	....	.....	1	4,537
East Indies—				
French	....	.....	1	5,438
Hongkong	....	.....	38	172,681
Japan	2	121,100	2	1,700
Russia in Asia	....	.....	1	700
Siam	....	.....	....	.....
Oceania:				
British—				
Australia	2	357	1	2,438
New Zealand	....	.....	4	1,542
Philippine Islands	22	11,905	286	424,807
Africa:				
Liberia	1	320	....	.....
	339	$1,006,652	551	$1,771,324

Enlarged Facilities in Florida

There was recently completed and put into service a large extension and addition to the shipbuilding plant of George F. Backus & Son at Ft. Pierce, Fla. A new office building has also been completed to replace that which was dstroyed by fire earlier.

The capacity of the works has been doubled by the addition of the new plant and machinery. This is all working to capacity and large motor boats are being turned out at the rate of one every five days. Material is being used up at the rate of a carload of white cedar every month.

Ever-Warm Suits Abroad

That the foreign field is opening up in good shape for the Ever-Warm safety suit is shown by the orders being filled by the National Life Preserver Co., of 11 Broadway, New York, N. Y.

The suits are being shipped in quantities to general agents recently established by contract in European countries. Three hundred suits have gone to Sweden as the initial sale to an extensive firm having branches in all the Scandinavian countries. Similar shipments are to follow for Finland, Norway and Denmark. The first consignment to the general agent in Holland is now being shipped. Agencies in England, France and Holland are being closed and extensive business is foreseen in the United Kingdom especially. Holland has ordered a large number of suits for early delivery.

Fishermen in Gloucester, Boston and other Atlantic centers have become enthusiastic over the Ever-Warm safety suit for their protection from drowning and exposure, for rescue work, for the man at the wheel and others who are most vital in time of bad storms. Hundreds of these men have seen the suit demonstrated at Gloucester and Boston, have been interested in moving pictures, showing groups of men and women in the suit, even amid the ice, and this field is opening up in the suit, amid the ice, with no signs of discomfort.

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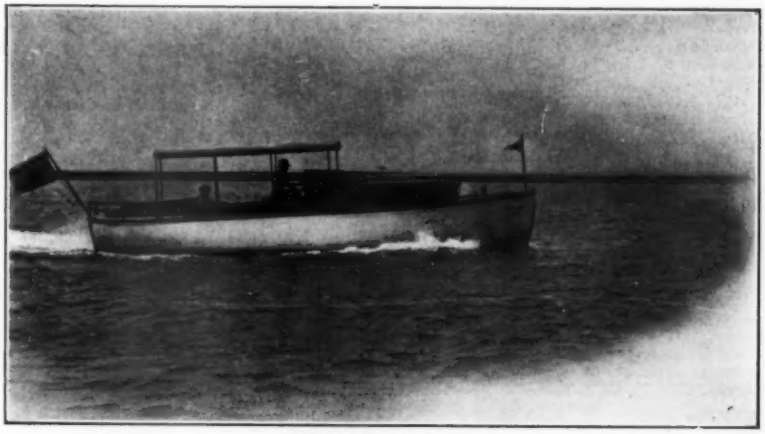
"FORGOTTEN ALL ABOUT TROUBLE"



His 32 ft. Cruiser

Ventnor, N. J., Sept. 14th, 1919.

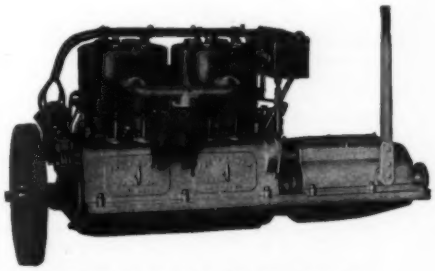
Fay & Bowen Engine Co.,
Geneva, N. Y.

Dear Sirs:

Three years ago I bought a 32-ft. cruiser and up until this summer I have not made a cruise, in fact hardly a trip, without some kind of engine trouble. Have changed motors twice and each time there has been just some little thing, such as poor oiling system or circulation, that has made everybody on board feel more or less uncomfortable. It is impossible to get the real enjoyment out of cruising under these conditions.

Early this Spring I installed one of your Model L43 Motors with self-starter and can honestly say that I have yet to have my first miss out of her. She starts at the first press of the button and runs like a watch until I shut her off. I have forgotten all about engine trouble.

Yours truly,
(Signed) LEGH R. MYERS.



Model L43, 4-Cylinder, 4½x5½

FAY & BOWEN ENGINE COMPANY

104 Lake Street, Geneva, N. Y., U.S.A.

NEW YORK: 44 Third Ave. at 10th St., Sutter Bros., Representatives
PHILADELPHIA: 610 Arch St., Marine Equipment & Supply Co., Representatives
BOSTON: 111 Haverhill St., Louis T. Carey, Representative
CANADA: Brockville, Ont., St. Lawrence Engine Co., Representatives

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Wyman-Gordon Crankshafts

"Guaranteed Forgings"—forgings made by a manufacturer who is constantly guarding a world-wide reputation— those are the only forgings you can afford to use in your quality product.

Correctly designed and skillfully balanced, *Wyman-Gordon Crankshafts* are accurately marked for machining—this is a distinct saving to manufacturers. They are made from specially selected steel and are properly heat-treated.

Add to this our Dependable Service and you realize what "Guaranteed Forgings" mean to the Engine Builder.

Wyman-Gordon Company

"The Crankshaft Makers"

Worcester, Mass. **Cleveland, Ohio.**

GORDON REVERSIBLE PROPELLER

Always Knowing Gordon Reversible are best—still we have improved them—

For your boat—A Gordon propeller will serve you in a way which will make you wonder why you ever used another.

For work—for pleasure—there is no better.

GORDON UNDERWATER EXHAUSTS eliminate noise, smoke, pounding, without retarding the motor.

The Gordon Propeller & Mfg. Co.
9001 Desmond Ave. **Cleveland, Ohio**

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Wyman-Gordon Crankshafts

"Guaranteed Forgings"—forgings made by a manufacturer who is constantly guarding a world-wide reputation— those are the only forgings you can afford to use in your quality product.

Correctly designed and skillfully balanced, *Wyman-Gordon Crankshafts* are accurately marked for machining—this is a distinct saving to manufacturers. They are made from specially selected steel and are properly heat-treated.

Add to this our Dependable Service and you realize what "Guaranteed Forgings" mean to the Engine Builder.

Wyman-Gordon Company

"The Crankshaft Makers"

Worcester, Mass. **Cleveland, Ohio.**

GORDON
REVERSIBLE PROPELLER

Always Knowing Gordon Reversible are best—still we have improved them—

For your boat—A Gordon propeller will serve you in a way which will make you wonder why you ever used another.

For work—for pleasure—there is no better.

GORDON UNDERWATER EXHAUSTS eliminate noise, smoke, pounding, without retarding the motor.

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9001 Desmond Ave. **Cleveland, Ohio**

Goblin Soap
WORKS WONDERS

GOBLIN SOAP is the great solvent of grease and grime: it cleans thoroughly by dissolving the dirt and not by scraping or cutting it off the hands and face.

The result is that the skin is left in a soft and healthy condition.

If you have tried other soaps for obstinate grease and dirt you'll be delighted with the quick yet gentle action of Goblin Soap.

Keep a cake handy — it meets every need.

If your dealer does not have Goblin Soap, send us his name and we will see that you are promptly supplied.

CUDAHY, 111 West Monroe Street, CHICAGO
64 Macauley Avenue, Toronto, Canada

For Toilet or Bath

Will not hurt the tenderest skin

ONLY